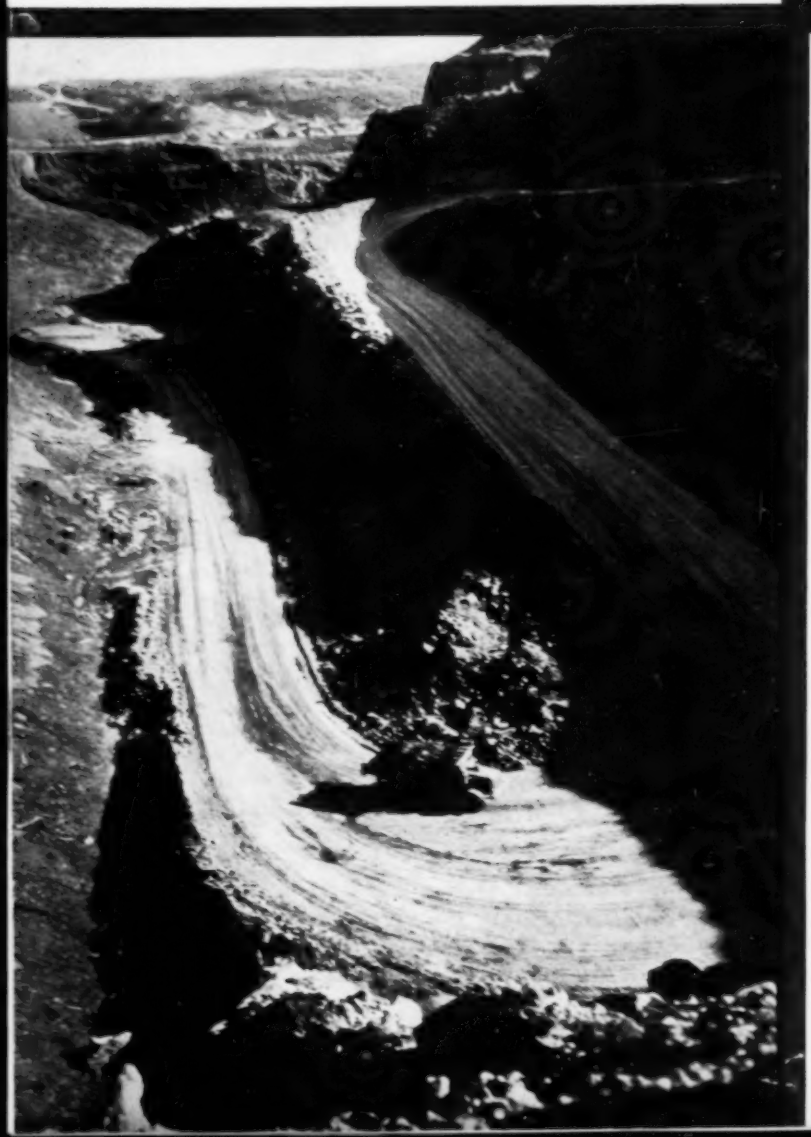
# Coal Age

APRIL, 1952

A McGRAW-HILL PUBLICATION — PRICE 50c



## Oilman Predicts 2½-Billion-Ton Year

"Fuel of Future," coal will expand rapidly in next 50 yr, but end use and transport methods will change. p 70

## Peabody No. 40

Loaders, shuttle cars, belts and 6-ton mine cars make new deep mine efficient. p 74

## New Spiral Unit for Tough Washing Job

Three-product cleaning and high media recovery feature new classifier plant. p 88

## Stop Roof Falls

You can prevent roof falls if you get a good plan and follow it, facts prove. p 93

## 530-Ft-Deep Pit

How Wadesville uses bench mining to produce 3,000 tons of anthracite daily from basin stripping. p 82

Full Contents on p 5

# HOW TO "MOVE" YOUR MINE
# 1 MILE 'CLOSER'
# TO THE UNLOADING STATION

## A.C.F. Drop Bottom Mine Cars unload so fast it's the same as cutting 1 mile off your hauling time!

75 seconds... that's the incredibly short time it takes to completely unload a trip of 15 A.C.F. Drop Bottom Mine Cars and have them ready to return for more coal! Compare that with the usual 5, 10 and even 15 minute unloading time for ordinary cars, and you can instantly see the remarkable savings. In many mines, these savings add up to an extra 'round trip each day... a substantial increase in production!

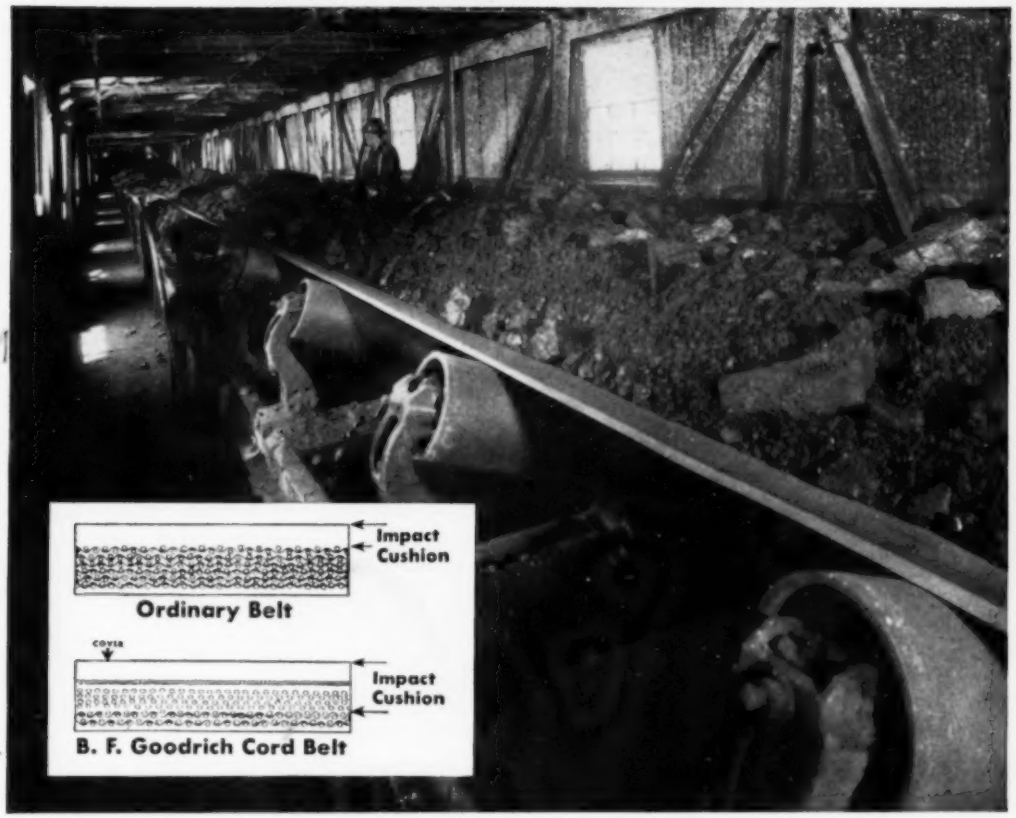
The secret is in the fully automatic operation. As the trip passes over the unloading point, each A.C.F. Drop Bottom Mine Car unloads itself, then closes and latches its own doors. The savings in time actually amount to the same as picking up your whole mine and moving it at least one mile closer to the unloading station!

Next time you plan to buy new haulage equipment, find out how much 'bonus tonnage' A.C.F. Drop Bottom Mine Cars can give. Your nearby A.C.F. Representative has the facts. American Car and Foundry Company, New York • Chicago • St. Louis • Cleveland Philadelphia • Washington • Huntington, W. Va. • San Francisco • Berwick, Pa.

# a.c.f. MINE CARS

*for Constant Haulage*

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER




# 12 years and 9 million tons with a B. F. Goodrich cord belt

## *Gives 2 to 6 times greater impact resistance*

RUN-OF-MINE coal and refuse are carried here, where a B. F. Goodrich cord belt moved 9 million tons in 12 years of service. The coal drops 3 feet onto the belt. This is typical B. F. Goodrich cord belt service because:

***Cord belt stands more impact***—Each lengthwise cord in a B. F. Goodrich cord belt is completely surrounded by rubber—no cross threads tie them together. Cords are free to "give" when impact occurs. Rubber distorts temporarily, distributing and absorbing a shock that would damage stiff, unyielding plies. As an extra protection, B. F. Goodrich has added a patented *Transcord Breaker*—an extra layer of parallel cords in rubber, placed across belt width. Acts as a shock absorber, stretches to prevent gouges and cuts from splitting belt cover.

***Cord belt troughs better***—There being no crossweave in the cord plies, cords are free to flex. Belt conforms to idlers, pulleys. Spillage is reduced, troughing is natural and belt keeps centered on idlers, sustains less damage, requires less maintenance. Longer centers, higher lifts can be used.

On the toughest coal-handling jobs, whether above ground or below, the B. F. Goodrich cord belt designed for coal-handling can do the job better, for less. Your local BFG distributor can show you how this belt can save you money, or write us direct: *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

*Conveyor Belts* BY
**B.F.Goodrich**
**RUBBER FOR INDUSTRY**

# NO SIR! YOU CAN'T BEAT THE

Ever since Pharoah's Egyptian experts blew the first goblets for the royal banquets some 4,000 years ago, no method superior to their production of fine glassware has been developed. You can't beat the expert at his specialty.

**HULBURT OIL & GREASE COMPANY**

*Specialists in Coal Mine Lubrication*

**PHILADELPHIA, PA.**

# EXPERT at his SPECIALTY!

## TAKE COAL MINE LUBRICATION—FOR INSTANCE

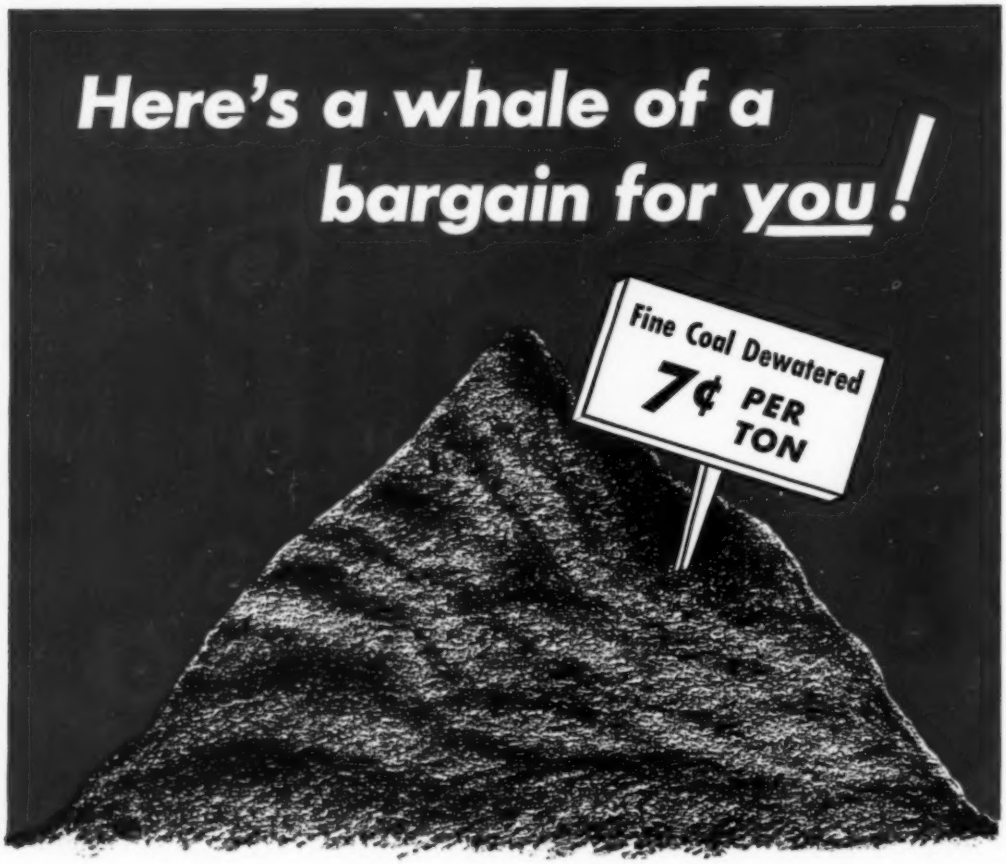
THAT'S WHY THERE'S NOTHING BETTER THAN

# Hulburt Quality GREASE

"The Champion"

Ever since the first drums of Hulburt Quality Grease went into the coal mines of America as a specialized product for lubricating coal mining machinery, no lubricant its equal or superior, made solely for one specific purpose, has ever been developed. Through all the years, Hulburt Grease has been the sole product of experts concentrating entirely upon the specific problems of protecting coal mining machinery from the effects of friction, through the right lubrication with the one right lubricant . . . and HULBURT QUALITY GREASE is the answer.

# Here's a whale of a bargain for you!

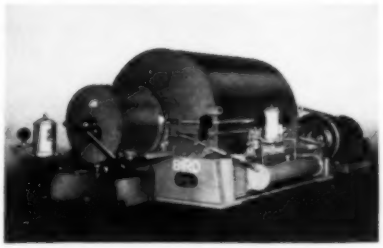



## The BIRD COAL FILTER

dewaters as much as a ton of fine coal per minute, getting it down to the very minimum of surface moisture that can be obtained by mechanical means.

Cost, including power, labor, amortization and maintenance comes to seven cents per ton or less.

With The Bird Polisher and Clarifying System the water is so clean that a completely closed circuit is effected. There's no longer a pollution problem.



All this is accomplished at one third the cost of other dewatering methods — truly, a whale of a bargain. Better look into it.

**BIRD MACHINE COMPANY**

SOUTH WALPOLE • MASSACHUSETTS

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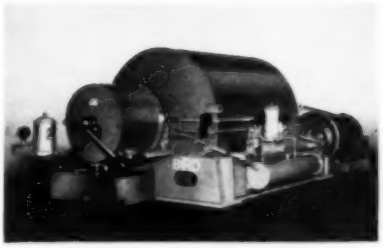

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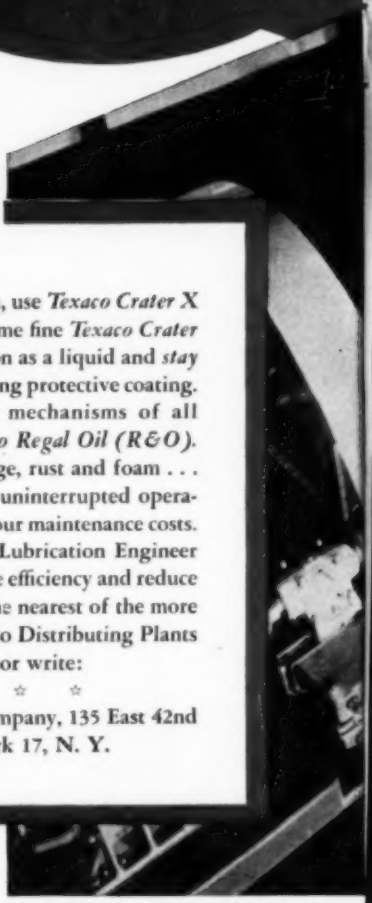

## ★ Lubricate with TEXACO CRATER

Whether your wire rope is above ground or below, under cover or exposed to weather, you can keep it strong longer by lubricating with *Texaco Crater*. This is the famous *penetrating* lubricant. It gets into the rope and protects the core. It surrounds each metal strand with a tough, long-lasting film that guards against wear and rust even under severest conditions.

*Texaco Crater* also assures longer life and better service from your open gears. It protects the teeth with a tough, clinging film that absorbs shocks, muffles noise and reduces wear.

If you prefer the convenience of fluid application, use *Texaco Crater X Fluid*. It's the same fine *Texaco Crater* designed to *go* on as a liquid and *stay* on as a long-lasting protective coating.

In hydraulic mechanisms of all types, use *Texaco Regal Oil (R&O)*. It prevents sludge, rust and foam . . . assures smooth, uninterrupted operation... reduces your maintenance costs.

Let a Texaco Lubrication Engineer help you increase efficiency and reduce costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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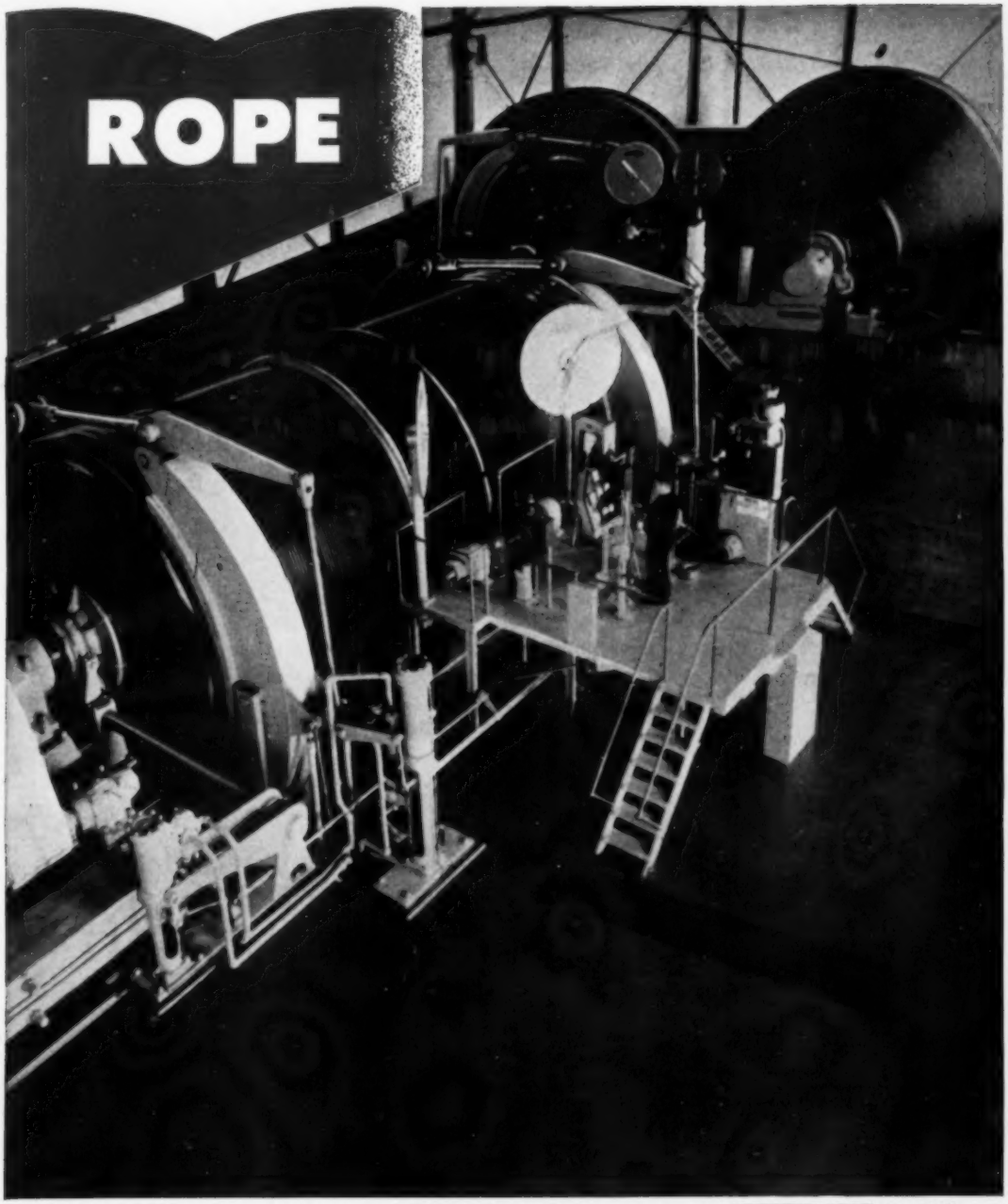
every Tuesday night.
See newspaper for
time and station.

TEXACO

# TEXACO LUBRICANTS




For the Coal Mining Industry

Faithfully yours
50
for Fifty Years.

# only Allis-Chalmers can offer you

# 1000 Hour

## for truck wheels, idlers, support rollers

### FULL PROTECTION — only One Greasing Every 1000 Hours — with Allis-Chalmers *Exclusive* Positive Seal, Roller Bearing Design!

Think of it! You can operate for 6 months on a 40-hour-week basis with just one lubrication of 14 to 20 of the most-abused, hardest-to-service points on a tractor. It's possible through an exclusive combination of glass-smooth Positive Seals and anti-friction bearings that help you do more work at lower cost even under toughest conditions! And it's another ahead-of-the-field design feature found only in the four new Allis-Chalmers tractors.

### *These Big Benefits Mean DOLLARS to you!*

DAILY GREASING PERIODS ELIMINATED. You save at least 30 minutes every day . . . gain about one full month's production every year.

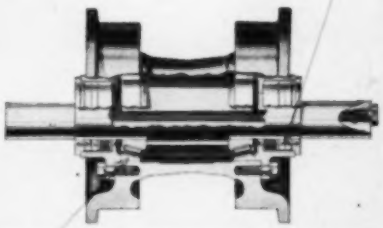
FULL PROTECTION ASSURED. Positive Seals keep grease in . . . dirt and moisture out. 1000-Hour Lubrication gives you protection unchallenged in the tractor field.

SAVES ON GREASE. Truck wheels, idlers and support rollers are grease-filled at the factory . . . need new grease only once every 1000 hours!

EASY TO SERVICE. No more cleaning of dirt, muck and grime from fittings every day. Operator can choose time and place to regrease when conditions are favorable.

### Here's the secret:

**Positive Seals** each have two spring-loaded steel rings — one stationary, the other turning with the wheel. Ground smooth as glass, they seal the grease in . . . keep dirt, grit, dust, mud and water *out*.



**Tapered Roller Bearings** protect the Positive Seals by letting truck wheels, idlers and support rollers rotate freely...without side thrust or wobble. Reduced friction lets the tractor move easier, produce more drawbar power.

## the newest finest tractor line on Earth!

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**DESIGNED FOR YOUR JOBS • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE**

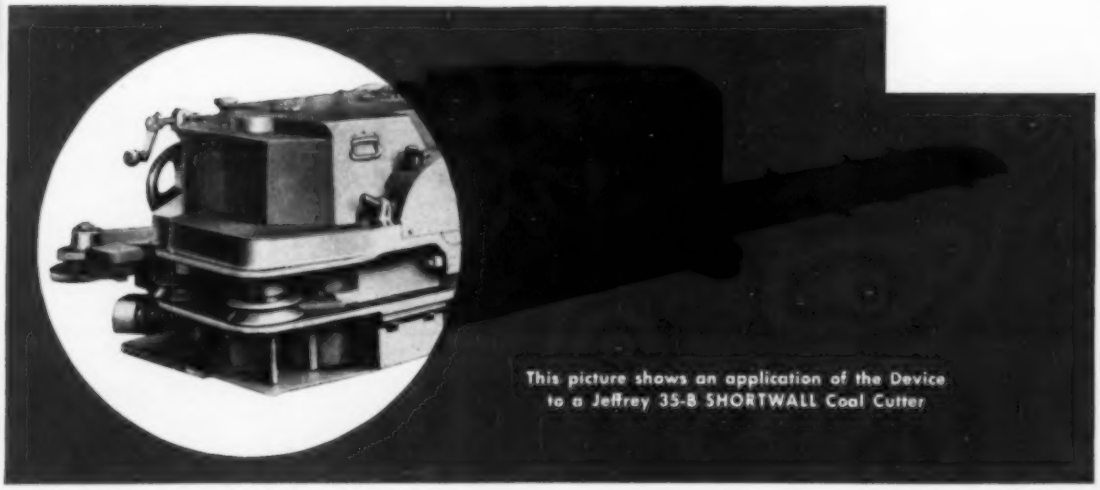
# Lubrication

ALLIS-CHALMERS

TRACTOR DIVISION MILWAUKEE 1, U. S. A.

Note the clean kerf in the above illustration

# SLACK *Handling* DEVICE *for* JEFFREY SHORTWALLS



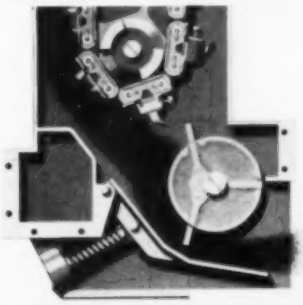
This picture shows an application of the Device to a Jeffrey 35-B SHORTWALL Coal Cutter

# JEFFREY
# SHORTWALL
# CUTTING MACHINES

## THIS SLACK *Handling* DEVICE

- **Discharges slack along the side of the cutter away from the kerf, assuring a better fall of coal.**
- **Eliminates cleaning kerf by manual labor.**

The picture below illustrates its construction. Manganese steel paddles move the cuttings from the cutter chain to rear of machine by means of an eccentric movement.



● Jeffrey 35 Series SHORTWALL Coal Cutters have had a wide acceptance in the field. Well-known are such features as: Simplified operation, rugged construction, low maintenance and overall accessibility in making repairs.

They are available in various sizes including the 35-L for low vein seams and the 35-BT machine designed for top cutting. Also available is a line of Coal Cutters in the Universal series as well as continuous mining machines.

The most recent development for our line of SHORTWALL Cutters is the Slack Handling Device which is described and shown in the various photos on these two pages. It can be added easily to your present Jeffrey 35-B and BB machines by removing the old bed frame extension and bolting to machine. As easy as that.

Let us tell you more about this Device in connection with our 35 Series Coal Cutters.

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912 North Fourth St., Columbus 16, Ohio

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The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
Galion (Great Britain Ltd.), Wakefield, England
The Ohio Malleable Iron Co., Columbus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio

# Can your rear-dump

Stripping bauxite in Surinam, Billiton Mines replaced their railroad network with 9 Tournarockers. In spite of 10% grades, extreme heat, and 120" annual rainfall, each unit delivers 150 cu. yds. of overburden hourly on 750' hauls.

## *Here's how* these advantages pay off

### Try one, buy two in California

Monolith Portland Cement Co. rented a Tournarocker for their mountain-face limestone quarry at Monolith. Its maneuverability over winding mountain roads, in restricted load and dump areas, and its output were so satisfactory the company bought both the first unit *and* another. The 2 Tournarockers now deliver 160 tons hourly on 400' cycles, all the shovel can dig.

### Boosts output in Pennsylvania

Loaded with 15 yds. of clay, Tournarocker hauls 700' up 10% grades, 820' up 4%... strips 130 yards hourly for J. Robert Bazley, Inc. at their Mt. Carmel, Pa., mine. 4200' cycle is completed in 7.4 min. . . . smaller trucks take 7.9 min. for same trip. "We're particularly impressed with Tournarocker's clean dump and its safety when rear wheels are over bank," says Owner Bazley.

LeTOURNEAU LET EQUIPMENT

**R. G. LeTOURNEAU, INC.,** *Export Division* Peoria, Illinois, U.S.A.
(Cable Address: "BOBLETORNO")

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

# haulers compare with C TOURNAROCKERS ?

### Turn around in a 13′ 9″ radius

When Tournarockers work a cramped rock job, there's no time wasted "backing all over the place" to load or dump. Because of its 2-wheel prime mover and positive-power electric steer, 18-ton Tournarocker turns in any footing within 13′ 9″ radius (less than half the rig's 29′ overall length), is ideal unit for work in restrictive quarters.

### Eliminate tire breakage in rough going

Tournarocker load is carried by four 21.00 x 25 low-pressure tires. These big tires reduce rolling resistance of duals . . . are bigger, heavier, stronger than duals . . . better adapted to withstand load and haul shocks. They have no divided face to wedge in rock fragments that wear and tear. They roll easily over rocks that might concentrate entire load on one or the other of the lighter duals, and result in bruising or breaking the fabric.

### Absorb punishment without costly repairs

Tournarocker's 3-ply, steel-grid bowl resists damage normally done when big-chunk rock is loaded. As a result, most welding and patching is eliminated. In addition, because Tournarockers have no frame, sub-frame, springs, spring hangers, drive shaft, front steering wheels or hydraulic system, many trouble spots are eliminated . . . spare part requirements reduced . . . maintenance costs kept down.

### Work and turn on steep grades in safety

With positive power steer, and instant electric controls, and 4-wheel, multiple-disc air brakes (3763 sq. in. total braking surface, more than 4 times that of other haulers), loaded Tournarocker may be driven at high speeds down narrow, steep winding haul roads with complete safety.

### Drive anywhere . . . dump safely over bank

Power-proportioning differential (which delivers up to 4 times the power to drive wheel on firmest footing) — plus the extra flotation and traction of giant tires — get rig through footing that stops conventional haulers. In addition, because it has power on front wheels, Tournarocker backs safely to edge of fill, dumps load clear over bank . . . eliminates most dozer clean-up.

### Interchangeable for further profits

For other jobs, you can easily interchange the 186 h.p. C Tournarocker prime mover with 4 auxiliary hauled units . . . 14-yd. Carryall Scraper, 18-yd. bottom-dump hauler, flat-bed, and 15-ton crane. Other Tournarockers (9, 35 and 50-ton) may also be interchanged with similar trailing units, each costing about 25% of original unit price. Prime mover change takes only a few hours. This equipment travels via highway or cross-country to their assignments. Ask your LeTourneau dealer for full details.

Carryall—Trademark Reg. U. S. Pat. Off.
Tournarocker—Trademark

### Whips tight quarters in Sweden

**Svenska Vag Akt. and Nya Asfalt Akt. are nearing completion of a 785,000-yd. 36′ wide, 40′ high, and 2.9-mi. long underground toll-race tunnel in Gavleborgs Province. "Our Tournarocker is superior to other units," says Chief Project Engineer S. Westby. "Its greatest advantage is its maneuverability and 13′ 9″ turning radius."**

### Licks 10% grades in Arizona

**Two 35-ton Tournarockers, stripping overburden for Bagdad Copper Corporation at Bagdad, Arizona haul loads, which by actual weight tests, average 37½ tons each. Time for each 4500′ cycle—including 2 min. to load, and 4½ min. to haul 2250′ (half of the distance up 10% grades) averages only 11.2 minutes. Dump time varies from 35 to 40 seconds.**

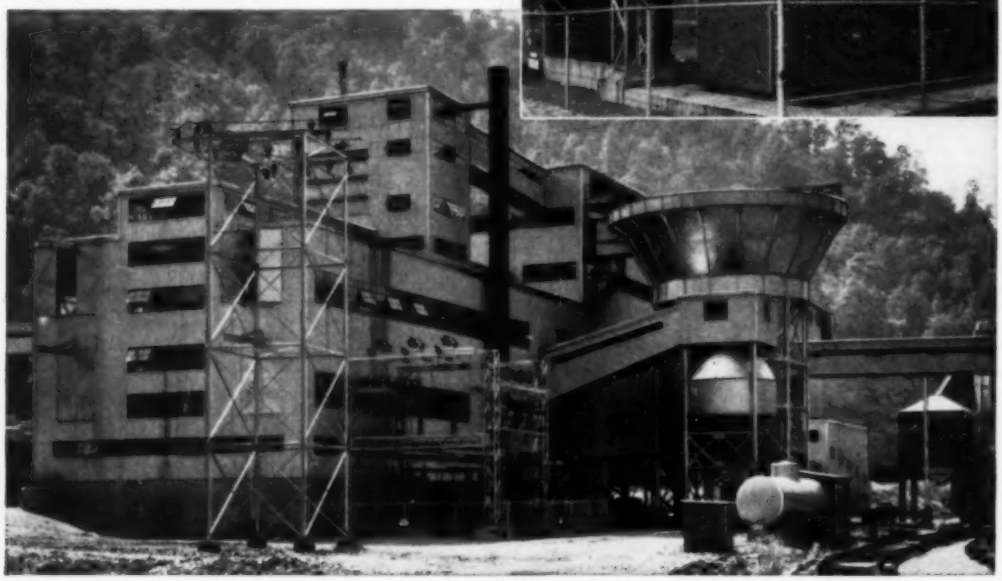
** Trademark
* Trademark Reg. U. S. Pat. Off.

122 or 186 h.p. TOURNADOZER*
14-yd., 18-ton TOURNAPULL*
18-yd., bottom-dump TOURNAHOPPER**
20-ton, flat-bed TOURNAHAULER**
15-ton lift TOURNACRANE*

# Electrically co-ordinated to keep clean-coal output at 750 tons per hour!

**New Price mine and preparation plant rely on General Electric equipment to maintain high operating efficiency**

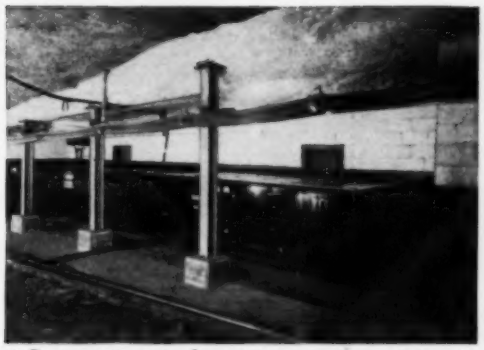
**Completed in May, 1950,** the Price Mine preparation plant of the Inland Steel Co. at Wheelwright, Ky., makes extensive use of co-ordinated General Electric equipment to minimize outage and maintenance delay, keep clean-coal output at rated capacity of 750 tons per hour. Here, ash and other impurities in the mined coal are removed to provide a high grade metallurgical coal, uniformly low in ash, for making coke. A 3000-kva G-E package substation—including transformers and switchgear—contains all equipment needed to step down incoming 44,000-volt power and distribute it at 480 volts to power the plant's motors.



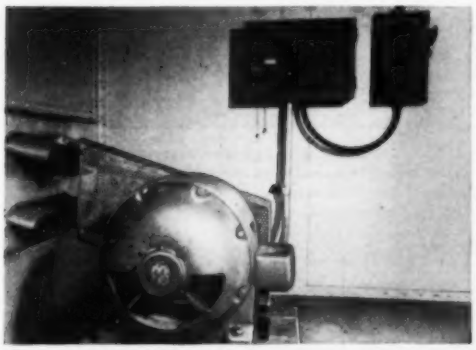
GENERAL ELECTRIC

663-14

**2 To haul coal** from the underground assembly yard to the preparation plant over a 5-mile haulageway, 6 G-E 15-ton high-speed haulage locomotives are used, fully equipped with air brakes and air sanding, and controlled by air-operated contactors. Efficient, powerful, fast and safe, each locomotive makes 5 to 6 round trips per 7½-hour shift, handles 60 cars, each of 4¾ tons total gross weight.

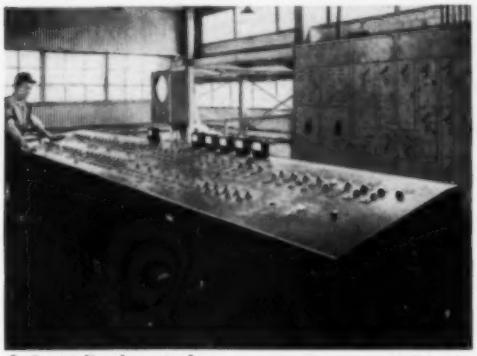


**3 To convert a-c to d-c** needed for locomotives and other mining machinery, two G-E 300-kw 275-volt d-c rectifiers are used, one stationary and one portable. High in conversion efficiency, these units are easily installed, give high service continuity with minimum maintenance, and are metal-enclosed to protect personnel. Portable type shown is easily relocated to give near-full voltage at the face for more efficient machine operation, and to eliminate long, expensive d-c cable runs.



**4 Ventilation for the mine** is supplied by a 4-foot high-speed fan driven by this G-E 2-speed Tri-Clad* motor rated 30/12½ hp, 1175/585 rpm, 440 volts. Tri-Clad motors—with 3-way extra protection built in against physical damage, electrical breakdown, and operating wear and tear—are available in enclosures for every mining use. G-E automatic 2-speed control above motor protects fan against single-phase operation, overload, and other possible interruptions to this vital operation.

**5 From the washers,** after cleaning, ¼" x 0 coal is fed into 6 centrifugal dryers (four shown) driven by G-E wound-rotor motors rated 150 hp, 900 rpm, 440 volts. Plant uses a total of about 3600 horsepower. And with dependable G-E motors and control co-ordinated into a smooth-running, efficient, and low-maintenance operation, each step in the preparation process dovetails with all other steps, minimizing production slowdowns, maintaining high service continuity.



**6 Centralized control** of plant operations is provided by this G-E main control desk. Push buttons, selector switches and indicating lights are all conveniently combined and centralized at one location, to co-ordinate operations closely, make most efficient use of manpower. G-E Cabinetrol* unit in background, one of several located at control points, contains switch and fuse combination starters, plus interlocks and timers to provide sequence operation.

*Registered trade mark of General Electric Co.

**7 All G-E equipment** for this mine was supplied on a G-E project co-ordination basis. Find out how this plan can simplify your ordering, save your time, help your consulting engineers and contractors to provide a co-ordinated system to meet your needs. Ask your G-E representative to tell you all about this plan, and send for Bulletin GEA-5308, a 32-page photo report on how G-E is benefiting typical preparation plants. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

**SHOWN ABOVE** is part of the strip mining operations of DeBardeleben Coal Corp., Empire, Alabama. Here, overburden approximates 54' of sandstone and shale. Six-inch horizontal holes, spaced 18' apart, are drilled about 50' deep and in the operation pictured there were 29 such holes.

# SPEEDS REMOVAL OF OVERBURDEN WITH DU PONT "NITRAMON"*

## in southern coal stripping operation

**LOADING CREW** places Du Pont "Nitramon" in one of the holes. "Nitramon" is the safest blasting agent known. In addition, it is packed in water-tight containers, may be loaded far in advance of shooting time, and is non-headache producing. It cannot be detonated with commercial blasting caps, or by fire, shock or friction. "Nitramon" Primers are used to detonate the charge.

**RESULT** of typical shot, using 11,000 lbs. of Du Pont "Nitramon," shows excellent fragmentation that allows easy removal of overburden with minimum delay. Estimated 47,000 cubic yards produced is yield of about 4½ cubic yards per pound.

**DU PONT "NITRAMON"**

*A Product of Du Pont Explosives Research*

DU PONT

150th Anniversary

Better Things for Better Living
. . . through Chemistry

**Look into Du Pont "Nitramon."** It's ideal for coal stripping operations. The Du Pont representative in your area will gladly give you complete information about this safest blasting agent. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

*Reg. trade-mark for nitrocarbonitrate blasting agent.

# "COLMOL" on TIMKEN® bearings helps coal mine operate in the black

THIS "COLMOL" continuous mining machine, built by The Jeffrey Manufacturing Company, does the work of three machines! It cuts, drills and loads coal in one operation without the use of explosives. The machine has a capacity of 3 tons per minute, can produce up to 50 tons per man-day.

To keep the "COLMOL" in top operating shape and to keep operating expenses to a minimum, Jeffrey engineers use a total of 178 Timken® tapered roller bearings in the breaker heads, pump drive, conveyor and transmission. Timken bearings help the "COLMOL" operate smoothly, with little noise and with practically no vibration . . . important factors in reducing operation fatigue.

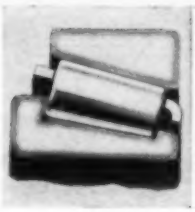
In heavy duty mining equipment, bearing load capacity is an important design factor. As a result of tapered construction, Timken bearings carry the thrust and radial loads in any combination. Gears are held in proper alignment, reducing wear and maintenance. Line contact between rollers and races provides load capacity to spare.

Timken bearings hold housings and shafts concentric. As a result, closures are more effective, dirt and coal dust are kept out, lubricant kept in.

If you're looking for low-cost, dependable performance in coal machinery or any other kind of equipment that uses bearings, be sure to specify Timken bearings. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

*This symbol on a product means its bearings are the best.*

**THE JEFFREY MANUFACTURING COMPANY** uses a total of 178 Timken tapered roller bearings throughout its "COLMOL" continuous coal mining machine.



**GREATER LOAD AREA**

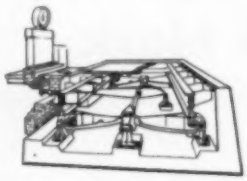
Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

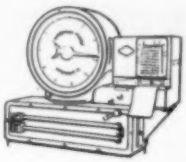
TIMKEN

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◎ AND THRUST ⊣⊢ LOADS OR ANY COMBINATION

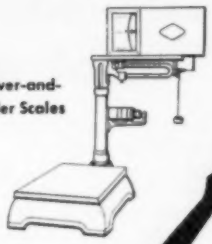


Truck Scales



Printomatic Dial Scales

Over-and-
Under Scales



Type Registering Beam Scales

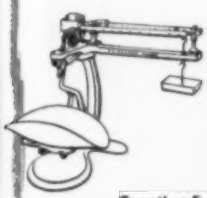
Bench Dial Scales

Portable Dial Scales

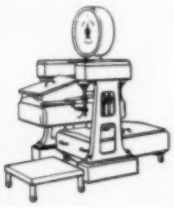
# Speeds your weigh!

FAIRBANKS-MORSE,
*a name worth remembering*

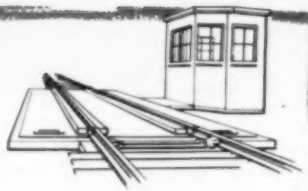
SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS



Counting Scales

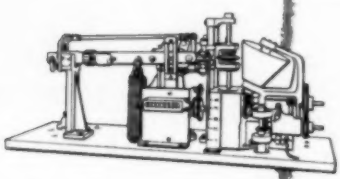


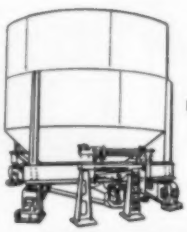
Weigh Can Scales



Railroad Track Scales

Belt Conveyor Scales





Hopper Scales

Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois

# WANT TO "SHRINK" YOUR ALUMINUM CABLES?

It is easy to do if you know how. Here's how. To operate at the same temperature, your insulated aluminum cable would have larger size conductors to compensate for the reduced conductivity of aluminum. It follows then that your conduits, fittings and connectors would all have to be larger than for copper.

But if you buy a cable having approximately the same size aluminum conductor that you would ordinarily buy if you were using copper, the aluminum cable will run considerably hotter than a copper cable would under the same load. So instead of using conventional insulations, which are seldom rated more than 140 F. (60 C.), specify Simplex-Anhydrex XX insulation. This will help overcome the heat problem, where voltage drop will permit, because Anhydrex XX is rated at 176 F. (80 C.).

Simplex-Anhydrex XX insulation will operate at temperatures up to 176 F. (80 C.) in either wet or dry locations at voltages up to 17,000. That's how you shrink aluminum conductors.

If you must use aluminum because of the copper shortage, let our engineers help you with your problem.

We would be more than happy to give you the latest specification data on Simplex-Anhydrex XX insulation. Simply send your request to the address shown below.

Simplex-Anhydrex XX is a product of Simplex Research.

**SIMPLEX-ANHYDREX XX**

SIMPLEX WIRE & CABLE CO.
79 Sidney St., Cambridge 39, Mass.

# How "Cat" DW10s helped Wyodak step up production!

THIS is the Wyodak Coal Company's mine near Gillette, Wyoming. The vein's from 40 to 90 ft. thick—and stripping overburden is no cinch, because you've got to contend with the toughest kind of gumbo. Hoping to step up the operation, Wyodak switched from other earthmoving equipment to an all "Caterpillar" lineup. They already had the "Cat" D8 Tractor with No. 8S 'Dozer—they added two "Cat" DW10 Tractors with No. 10 Scrapers.

Working a seven-hour day with the D8 push-loading, the two DW10s averaged 75 loads each on a half-mile haul. Production per load averaged 13 pay yards—a total of 1,950 pay yards per day. And remember, that's handling wet, sticky gumbo. "These rigs are living up to 'Caterpillar's' recommendations," Wyodak men say. "They're performing very satisfactorily with a minimum of running repairs."

Increased production is important these days—and "Caterpillar" machines are built to stand up under heavy demands. Of course, with good care they'll give you longer life. The defense effort demands that they wear longer. So keep them in good shape—have your "Caterpillar" Dealer recondition parts before they become unusable. By taking your service problems to him, you'll get many extra working hours from "Caterpillar" equipment.

**CATERPILLAR,** PEORIA, ILLINOIS

**CATERPILLAR**

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

# PROSPECTING

with a

# JOY 22-HD CORE DRILL

means a 3 WAY advantage!

1. HIGH MOBILITY
2. HIGH DRILLING SPEED
3. HIGHLY ACCURATE RESULTS

You'll get true cores FAST, and *at lowest cost* with the Joy 22-HD. It's a really fast, heavy-duty diamond core drill that's designed for very accurate work in all types of formations to depths of 2,000 ft.

The 22-HD is furnished with gasoline, electric or compressed-air drive, all interchangeable, to suit the power source at hand. It can be furnished mounted either on skids or a truck—and the swivelhead can be screw-fed or hydraulic, as desired. The truck-mounted unit can be set up and ready to drill within thirty minutes. ● *Write for Bulletin D-28, containing full data.*

*Consult a Joy Engineer*

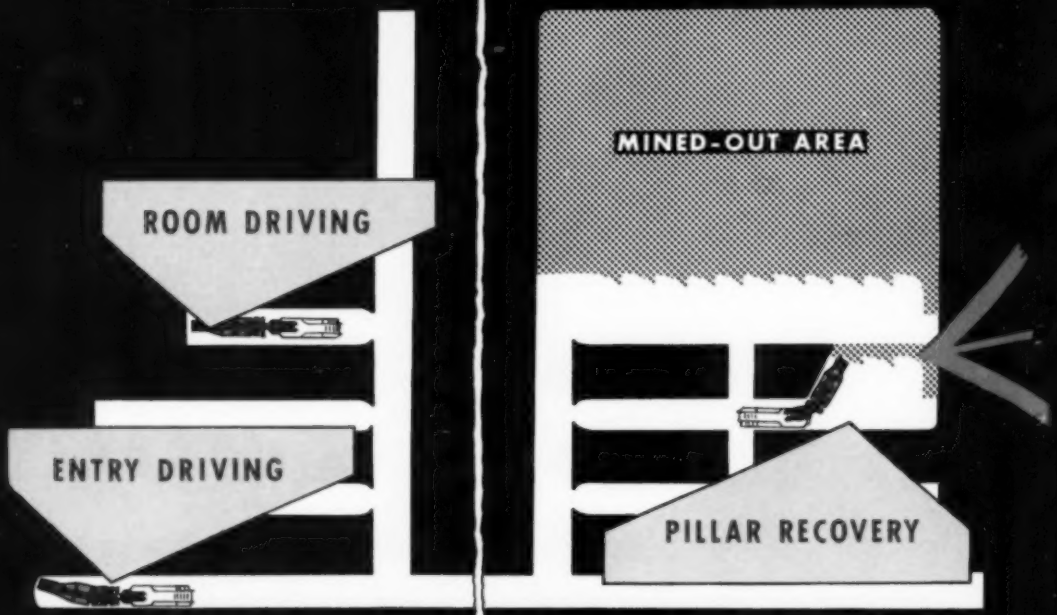
W & D M 4035

## JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

## THE FLEXIBILITY THAT MEANS PEAK EFFICIENCY!



# YOU GET GREATEST COAL RECOVERY

# with the JOY CONTINUOUS MINER

A Joy Continuous Miner can operate in any mine it can enter. Thin seams, thick seams, split seams—all can be efficiently worked with this powerful, versatile machine that gets your coal without shooting . . . requires only the necessary additional equipment to transport the coal out of the mine.

Not only does the Continuous Miner do a quick, thorough job driving entries and rooms, it's also topnotch at pillar-recovery. These three main functions are illustrated in the drawing at the top of the page at left. Note how the Miner-and-shuttle-car team retreats after driving up a room, taking pillar as it comes back. The photo opposite shows a JCM on pillar recovery in a midwestern mine.

The Joy Continuous Miner is built in two models and four heights. The 3-JCM can be either 34″ or 39½″ high, and will mine from 6″ below to 66″ above bottom. The 4-JCM is available in 48″ or 53¼″ heights, and will mine from 5½″ below to 98½″ above bottom. With special equipment the 3-JCM can mine to 76″ above bottom, and the 4-JCM to 120″ above bottom.

A Joy Engineer will furnish full details on the Joy Continuous Miner. He will show you exactly how it can be used for high-production mining in your operation, at absolute rock-bottom cost per ton of coal mined.

*Consult a Joy Engineer*

WBD CL 4180

## JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# JOY PLUGS

NO. D3A375RM Male

## MINING'S CHOICE *for* PORTABLE POWER TRANSMISSION

Modern mining technique permits no pampering of men or equipment. From power source to working face, everything must keep pace with production schedules. That's why it's important to *you* that more JOY connectors are used in mining operations than all other brands combined.

This proves that JOY plugs, receptacles and distribution boxes "measure up" to the industry's high standards for performance, safety and durability.

JOY plugs are molded to cable as one-piece Neoprene units—shatter-proof, wear-resistant, and impervious to the deteriorating effects of moisture, grime or oil. Through them, power cable can be sectionalized into easily handled lengths for rapid replacement of damaged sections.

JOY plugs are supplied for A.C. or D.C. operation in current capacities as required. They are available in three or four-contact models, described below, and also with one or two conductors. ● Write for complete details and bulletin today!

NO. D3A375RF Female

*Straight Pin Bigun (SPB) plugs illustrated at top and left are JOY's three-conductor style with pilot contact. Note reversed contact for polarization and grounding.*

### 3-CONDUCTOR DESIGNS (*for D. C. Application*)

REVERSED PIN PLACEMENT: Male plug has one socket that engages contact pin in female plug for grounding and polarization. Supplied for #10 through 750 MCM wire sizes.

PILOT PIN DESIGN: As above except for two additional "pilot control" contacts that may be shunted or carried through cable on #10 wire. Supplied for #8 thru 500 MCM wire sizes.

### 4-CONDUCTOR DESIGNS (*for A. C. Application*)

REVERSED PIN PLACEMENT: Male plug has one socket that engages contact pin in female plug for grounding and polarization. Supplied for #10 through 500 MCM wire sizes.

PILOT PIN DESIGN: As above except for two additional "pilot control" contacts that may be shunted or carried through cable on #10 wire. Supplied for #10 through 400 MCM wire sizes.

IMPORTANT: Pilot pin designs are *permissible* when used with JOY Safety Circuit Center power distribution boxes. *Write for complete details.*

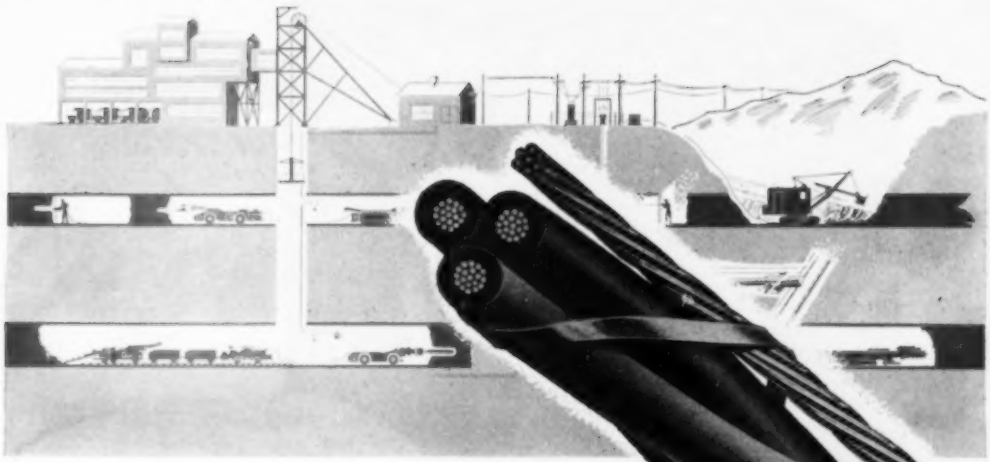
*Consult a Joy Engineer*

W&D ME 4131

# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



***safe . . . compact . . .***

***low cost . . . easy to install . . .***

# HAZARD SELF-SUPPORTING CABLE

## FOR POWER TRANSMISSION

**Versatile . . . that's Hazard-Self Supporting Cable for power transmission in and around the mine. Its "all-in-one" construction (pre-assembled cable, messenger and binder) requires a minimum of space, makes it easy and quick to install . . . simple to relocate. And it can be furnished with Hazard's reverse-lay design which permits spreading of the conductors for easy tapping anywhere along the cable.**

**Because of these advantages, it is an ideal cable for overhead suspensions between buildings and shaft structures, carrying power through heavily wooded areas, and for side wall or roof suspensions in underground slopes and entries. For all power transmission lines, Hazard Self-Supporting Cable is engineered and constructed to give extra long life under the severest mine operating conditions.**

**Hazard Self-Supporting Cable is insulated with Watertite heat and moisture resistant insulation and protected by Hazard's famous Hazaprene ZBF sheath. This smooth, abrasion-resistant covering possesses maximum density and lasting toughness to stand up against weather and destructive mine water. In addition, Hazaprene ZBF sheath more than meets the requirements of the Federal Bureau of Mines and the Pennsylvania Department of Mines for flame resistance.**

**For complete information on this versatile power transmission cable see your Hazard representative or write Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.**

**HAZARD**

Minestarter
PAIRED FOR PRODUCTION
Life-Line motor
DO NOT LUBRICATE

# *Dependability...*

## wrapped in explosion-proof construction

Here's an explosion-proof team that has the inherent dependability so important to today's mining operations. There's no time to pamper motors and controls. After installation, they have to stand on their own feet. These Life-Line motors and Minestarters have been establishing such a record for many years. They're built to meet Bureau of Mines standards.

***Look at this Life-Line SK d-c motor.*** Its pre-lubricated double-sealed bearings need no lubrication. The bearings are sealed, too—no chance for grit or dirt to enter and cause bearing wear. The heavy all-steel frame and feet add extra mechanical strength—stand up to the daily abuses encountered in many mine locations.

***What about the Minestarter?***

Its design provides continuous operation. Magnetic blowouts on the magnetic contactor quickly confine, divide and extinguish the arc—minimize burnout of contact tips. Contacts operate with a rolling action—confine arcing to the tips of the contacts. Thermal overload relay lags on short high-current peak during starting—acts instantaneously when overload can cause damage.

Talk it over with your Westinghouse representative. Ask him for a specific recommendation to meet your problem. Or, write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21650

YOU CAN BE SURE... IF IT'S

Westinghouse

MOTORS and CONTROLS

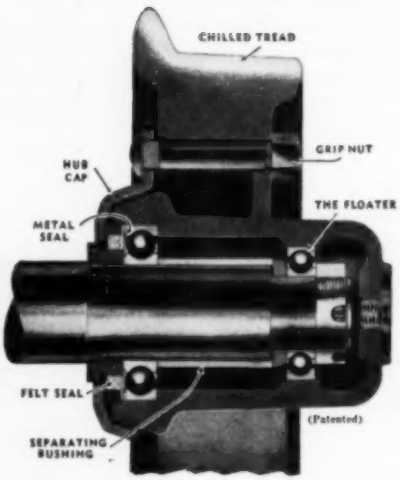
# You may have a production Bottleneck HERE!

"Why didn't I discover that before!" How often this question pops up when suddenly you find a costly leak in maintenance. That's why we suggest you check your car wheel up-keep now. If you are not using S-D "Floater" Ball Bearing Wheels, your present wheels unknowingly, may be, a production bottleneck—retarding output by wasting grease, labor and power.

S-D "FLOATER" LUBRICATION SAVINGS . . . grease stays in the wheel, dust and dirt out because S-D "Floaters" have a solid closed front hub and back double seal.

S-D "FLOATERS" LABOR SAVINGS . . . any unskilled worker can remove a "Floater" wheel by unscrewing only three nuts. When wheel is off bearings always remain on axle in perfect adjustment.

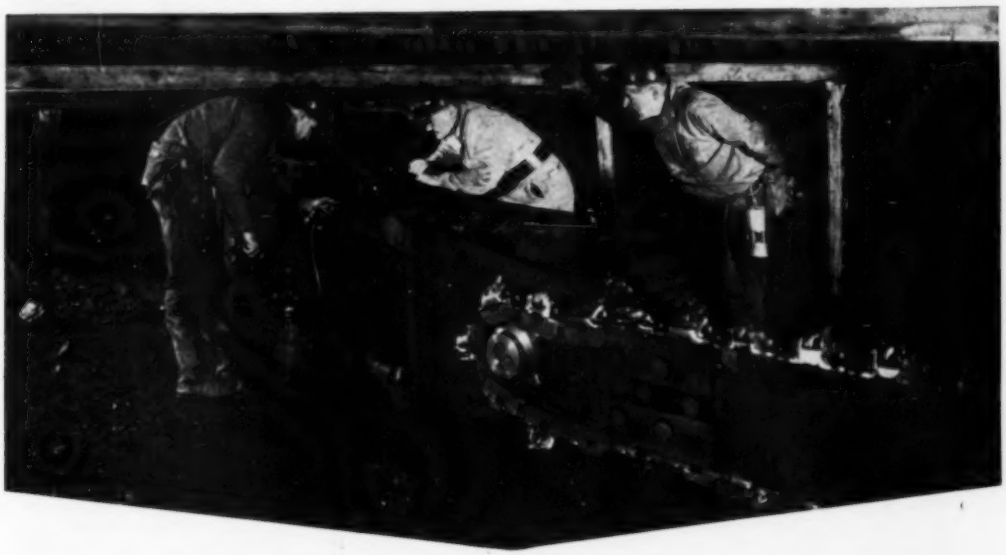
S-D "FLOATER" POWER SAVINGS . . . independent engineering firm tests prove that locomotives can pull up to 50% greater loads when cars are equipped with S-D "Floaters" instead of other types of precision bearing wheels . . . a big power and time saver! For faster, cheaper hauling . . . for less maintenance . . . for longer wheel life — S-D "Floaters" are your best wheel buy! Write today for complete information. Sanford-Day Iron Works, Knoxville, Tenn.




## SANFORD-DAY IRON WORKS

# LUBRICANT STORAGE AND HANDLING SIMPLIFIED!

## Gulf Mining Machine Lubricant does the job of 2 or 3 other lubricants —*and does it better*



Here's effective help in your efforts to reduce maintenance costs and simplify lubricant storage and handling—from oil house to face! When you use Gulf Mining Machine Lubricant you can eliminate from 2 to 3 other lubricants depending on the type of equipment you operate. This means less confusion at the face, elimination of application mistakes, better lubrication.

At the same time Gulf Mining Machine Lubricant provides better protection for underground cutting and loading equipment; it resists leakage from gear cases; its superior lubricating value insures less wear; its exceptional adhesiveness prevents throwoff or channeling; and its resists the washing action of water.

Gulf Mining Machine Lubricant is equally effective for plain and anti-friction bearings and for gears in drives and transmission.

To get the many benefits possible with this quality product, and for expert help in other phases of improved lubrication, call in a Gulf Lubrication Engineer. Write, wire, or phone your nearest Gulf office today.

Gulf Oil Corporation · Gulf Refining Company
Gulf Building, Pittsburgh 30, Pennsylvania

GULF INDUSTRIAL LUBRICATION

# "Carlon is easier to Install"

"We save time with **CARLON** pipe because it's easier to install. Long lengths require fewer fittings and, since the pipe is flexible, we can bend it around curves to eliminate many connections needed with other types of mine pipe."

**CARLON** plastic pipe can be installed promptly wherever needed, either for emergency service or for permanent use. Lightweight and flexible, it is handled easily in long lengths without materials handling equipment. It conforms to irregular surface contours and curving slopes and entries.

Guaranteed against rot, rust and electrolytic corrosion, **CARLON** plastic pipe has a trouble-free service life many times longer than ordinary pipe. It is unaffected by sulphurous waters, alkalies, metallic salts and other corrosive wastes. Smooth internal surface will not accumulate scale.

| NOM. SIZE | O.D. | I.D. | EST. BURST P.S.I. | WT. LBS. PER FT. | SHPG. LENGTHS |
|---|---|---|---|---|---|
| ½" | 0.840 | 0.622 | 540 | 0.103 | 400 ft. coils |
| ¾" | 1.050 | 0.824 | 330 | 0.140 | 400 ft. coils |
| 1" | 1.310 | 1.070 | 200 | 0.181 | 300 ft. coils |
| 1¼" | 1.660 | 1.380 | 200 | 0.267 | 300 ft. coils |
| 1½" | 1.900 | 1.610 | 200 | 0.320 | 250 ft. coils |
| 2" | 2.378 | 2.070 | 170 | 0.445 | 200 ft. coils |
| 2½" | 2.875 | 2.469 | 170 | 0.680 | 200 ft. coils |
| 3" | 3.504 | 3.070 | 165 | 0.910 | 100 ft. coils |
| 4" | 4.504 | 4.030 | 150 | 1.250 | 25 ft. str. |
| 6" | 6.630 | 6.070 | 115 | 2.230 | 25 ft. str. |

*Specify the Pipe with the Stripe!*

**Write today for catalog**

CARLON CP one-Cl

**CARLON PRODUCTS CORPORATION**

*In Canada: Micro Plastics, Ltd., Acton, Ontario*

**10300 Meech Avenue • Cleveland 5, Ohio**

# You save 12 ways

## with Goodyear's Coal-Flo Conveyors

1. Coal-Flo conveyor haulage eliminates tracks, switches, bonding, heavy grading; operates efficiently over pitches and rolls without jamming or mashing coal.

2. Cuts timbering cost up to 50%. Belt runs close to rib, enabling you to use a single prop under the center of the roof-load and insure far greater safety with much less timber.

3. Up to 20% more lumps from low seams, due to greater clearance between belt and roof, plus gentler handling.

4. No danger of runaways with peril to "hot-footers." Haulage injuries are virtually unknown.

5. Far greater ton-per-hour capacity because haulage is continuous—you lose no time to car spotting—keep cutters and loaders going without time out.

6. Greater safety from fire and explosion through elimination of bare wires, charged coils, sparks and broken cables.

7. Far less brushing—you leave your gob inside even in low-seam coal because Coal-Flo belts require minimum headroom.

8. From 50% to 75% lower power, maintenance and operating cost—you need no haulage crews with Coal-Flo belts.

9. Silent operation lets you hear a "working" roof.

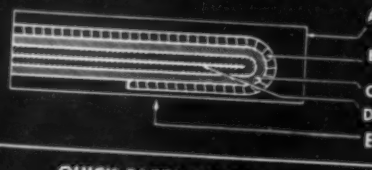
10. Fewer roof falls because of safer timbering and vibration-free operation.

11. More uniform power demand—no surges, peaks and valleys that occur with intermittent operation. You get better voltage regulation.

12. Continuous, uniform, automatic delivery at the tipple; you need no dumping crew.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GM-Specified COAL-FLO CONVEYOR BELTS



A Tough, thick cover of acid-resistant rubber withstands abrasion, cuts, gouging.

B Sturdy horseshoe-shaped breaker. Lens weave of transverse cord protects edges from fraying and wicking acidic moisture.

C Plies of strong, sturdy fabric.

D Rubber skim coat between plies increases flex-life over small pulleys.

E Mildew-inhibited throughout as protection against destruction by mildew.

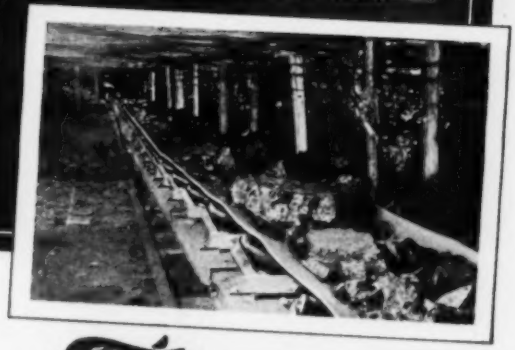
QUICK FACTS ON COAL-FLO

Designed for correct troughing, good training and easy steering.

Exceptional ability to hold fasteners.

Mildew-inhibited throughout to guard against destructive mildew found below ground.

Special sizes to fit all operations, as well as standard 24" widths x 4 ply and 30" x 5 ply; 28, 32, 42 or 48 oz. duck. Also available with rayon duck carcass for less weight and stretch.



FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING, RUBBER-COVERED ROLLS

*built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor. Look for him in the yellow pages of your Telephone Directory.*

# GOODYEAR

## THE GREATEST NAME IN RUBBER

*It's think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network*

Goodyear—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

## *Straight-from-the-shoulder facts show you save in every way with*

# CHEVROLET *Advance-Design* TRUCKS

**FACT No. 1**

**COSTS LESS TO BUY**

Match a Chevrolet truck against any comparable truck capable of handling the same payloads. You'll find Chevrolet trucks *list for less*, yet bring you ruggedness, stamina and great features not found in the other truck.

**FACT No. 2**

**SAVES MONEY ON THE JOB**

Experienced truck operators know Chevrolet trucks cost least to own and maintain. Valve-in-Head economy, in the Chevrolet Loadmaster or Thriftmaster engines, saves on gas. Four-way engine lubrication reduces wear and oil costs. Rugged construction means long life.

**FACT No. 3**

**RIGHT TRUCK FOR EVERY LOAD**

Chevrolet trucks are *factory-matched* to your payload and service requirements. You don't buy "too much truck" or "too little truck." Frame, axles, springs, body, brakes and power are *balanced* for the job.

**FACT No. 4**

**KEEPS ITS VALUE LONGER**

Records show that Chevrolet trucks traditionally bring more money at resale or trade-in than many other makes. Chevrolet's market value stays up because the value stays *in!* More proof that Chevrolet is the best truck buy! See your Chevrolet dealer soon.

**CHEVROLET ADVANCE-DESIGN TRUCK FEATURES**

TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

first in demand in value in sales

CHEVROLET

# Using the RIGHT Wire Rope for the Job?

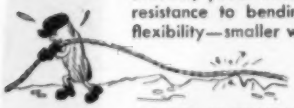
You'll get longer service life from wire rope if you do. Here are some points to keep in mind when you're selecting wire rope for any equipment . . .

## STRENGTH

Don't send a boy to do a man's job. Make sure the wire rope you order has enough strength to take care of the maximum load—*plus* a necessary safety factor.

## FLEXIBILITY

If your ropes undergo repeated bending over small sheaves, you'll need a flexible rope with maximum resistance to bending fatigue. Two things increase flexibility—smaller wires and preforming.



## ABRASION RESISTANCE

Lang lay ropes, when properly installed, and constructions with large outer wires will help extend the service life of drag lines and other wire ropes that are subject to severe abrasive wear.

## RESISTANCE TO CRUSHING

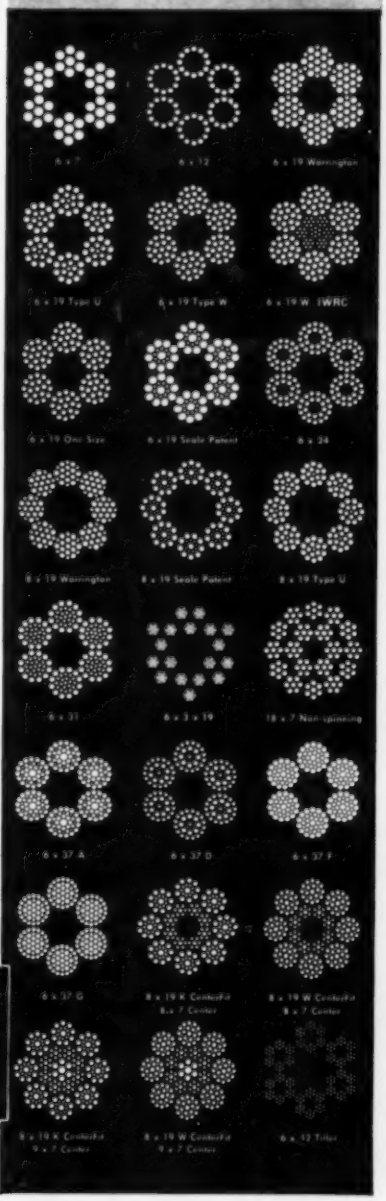
An independent wire rope center gives outside strands the support necessary to withstand crushing and distortion—large outer wires help spread the load over a greater area.

When you're looking for ways to cut operating costs, why not enlist the help of your nearest J&L Wire Rope representative? He'll help you select the *right* balance of these wire rope properties to get the longest service life on your specific type of equipment and operating condition.

Through years of research and actual operation in the field, J&L has developed a complete line of wire rope sizes and constructions. You'll find it profitable to cash in *NOW* on J&L experience and manufacturing know-how.

**J&L STEEL**

## Select a Wire Rope that Fits Your Equipment Needs


6 x 7
6 x 12
6 x 19 Warrington
6 x 19 Type U
6 x 19 Type W
6 x 19 W IWRC
6 x 19 One Size
6 x 19 Seale Patent
6 x 24
8 x 19 Warrington
8 x 19 Seale Patent
8 x 19 Type U
6 x 31
6 x 3 x 19
18 x 7 Non-spinning
6 x 37 A
6 x 37 D
6 x 37 F
6 x 37 G
8 x 19 K Centrafix 8 x 7 Center
8 x 19 W Centrafix 8 x 7 Center
8 x 19 K Centrafix 9 x 7 Center
8 x 19 W Centrafix 9 x 7 Center
6 x 12 Tiller

JONES & LAUGHLIN STEEL CORPORATION

401 Jones & Laughlin Building • Pittsburgh 30, Pennsylvania

# Built to Resist Tube Swelling

**...and to withstand toughest use**

**TUBE SECURELY LOCKED BY SPECIAL STAINLESS STEEL INNER WIRE BRAID**

Illustration shows, in magnified detail, the exclusive protection feature—special stainless steel inner wire braid—you get only with CONCORD 220 STEAM HOSE. Promotes extra safety and longer hose life—fights tube swelling.

This famous BWH hose features a structural "exclusive" that's there for one purpose: *to fight tube swelling under continuous high pressure.*

Protection found only in CONCORD #20 STEAM HOSE, this consists of a tough inner lining of stainless steel wire braid. This helps assure retention of original inside hose diameter . . . acts against swelling and constriction of tube . . . promotes full flow of steam and easy recoupling in the field when necessary.

Other construction features of CONCORD #20 include: two or three braids (depending on size) of alternate high tensile steel wire and rubber layers firmly bonded over outside of tube . . . to provide maximum burst protection and safety; asbestos braid gives positive cover adhesion and serves as cover insulator; finally, the rugged, abrasion-resistant cover is built to withstand severest abuse.

FLEXIBLE . . . TOUGH . . . DEPENDABLE, that's CONCORD #20 STEAM HOSE. Put it to work for you now, get in touch with your nearby BWH distributor today.

BWH
DEPENDABLE RUGGEDNESS

*Another Quality Product of*

**BOSTON WOVEN HOSE & RUBBER CO.**

Warehouse Stock: 111 N. Canal St., Chicago, Ill. Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

# triple play for profit

## with P&H ELECTRIC SHOVELS

All three of these P&H Electric Shovels are at work for J. Robert Bazely at Pottsville, Pa. There are three sizes at work here — 4, 5 and 6 cu. yds., all delivering steadily at rock bottom costs.

**P&H leads the field in Electric Shovel Developments.**

It's the same pattern wherever these new P&H Electric Shovels go to work: The first machine sells the second — the third — and more.

The reasons are plain and simple — *better performance — bigger production — lower tonnage cost.*

Reasons behind the reasons are such advantages as P&H Magnetorque* which powers hoisting motions electro-magnetically — smoother, faster, more dependably . . . rugged all-welded construction with more strength to withstand shock loads . . . independent propel for quicker move-ups . . . stepless control which eliminates all contactor troubles . . . filtered air cab ventilation for less electrical down time.

The cold, hard facts that count are: *performance, production, low tonnage cost.* Figure your costs with P&H Electric Shovels and you'll find a convincing difference. It explains why every third P&H Electric Shovel sold is a repeat order.

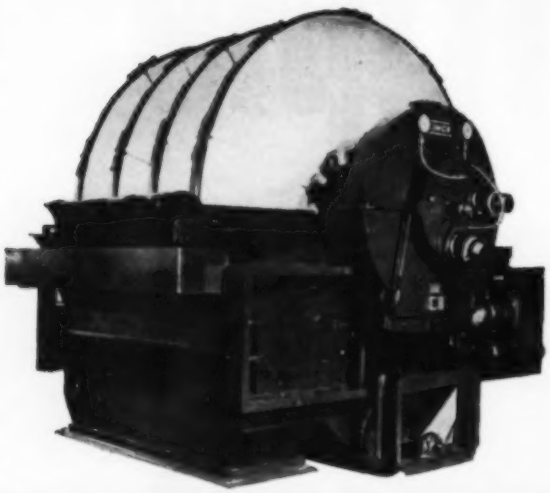
*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

P&H ELECTRIC SHOVELS
4540 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

*Every third P&H Electric Shovel sold is a repeat order*

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • PRE-ASSEMBLED HOMES

# Putting Coal Fines on the Profit Side of the Ledger

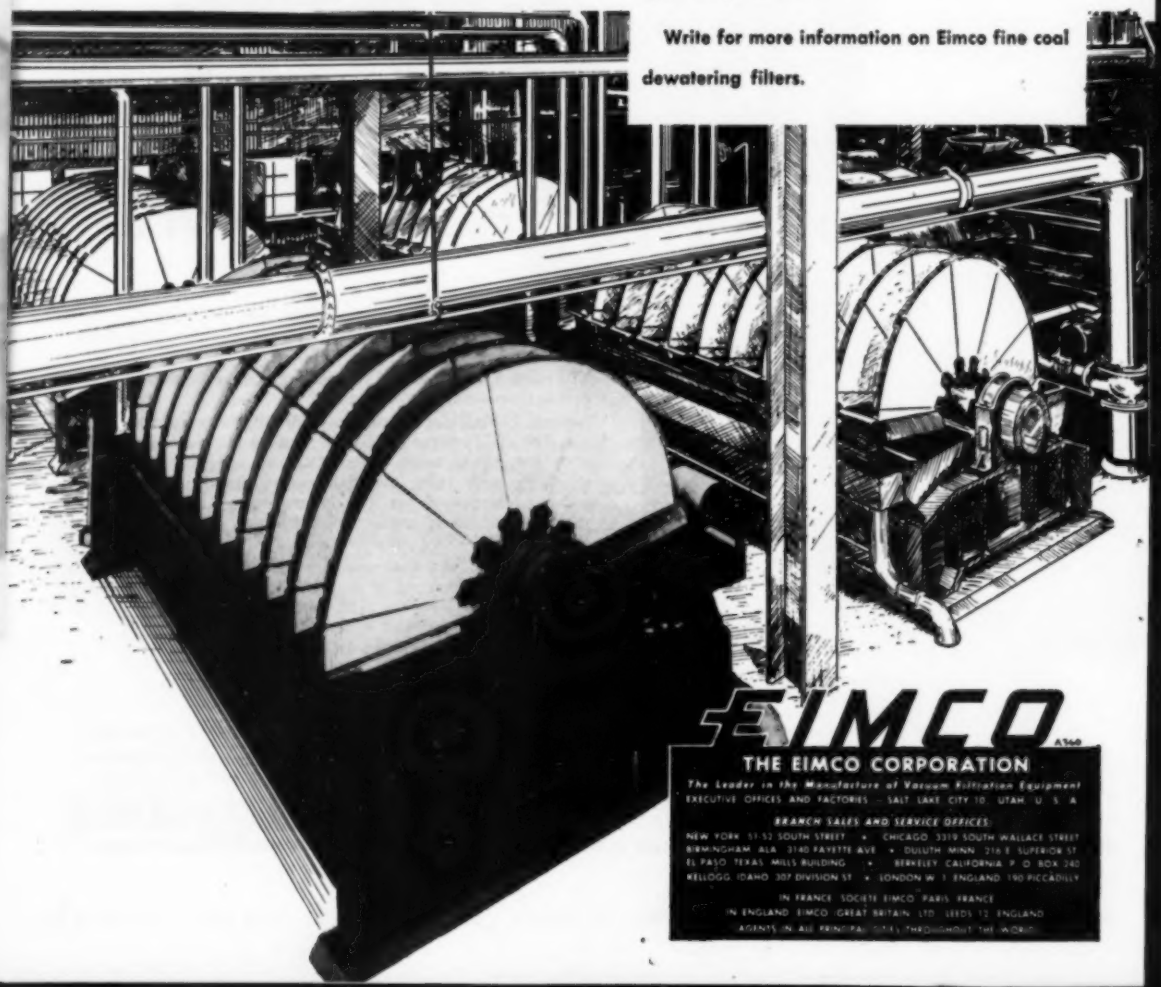


**Valuable Coal Fines are being dewatered on Eimco Filters and sold at a profit in many places where they were regarded as waste.**

**A clear water discharge from your Eimco filter means that every bit of coal cut and delivered to the washer is bringing its share of revenue.**

**Eimco Agidisc filters offer many advantages over other types of dewatering equipment, such as: low initial investment, lower moisture content in the coal cake, even drying, greater tonnage per square foot, per hour and small floor space requirement.**

**Write for more information on Eimco fine coal dewatering filters.**



EIMCO

A-560


**THE EIMCO CORPORATION**

*The Leader in the Manufacture of Vacuum Filtration Equipment*

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IN ENGLAND, EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL COALFIELDS THROUGHOUT THE WORLD

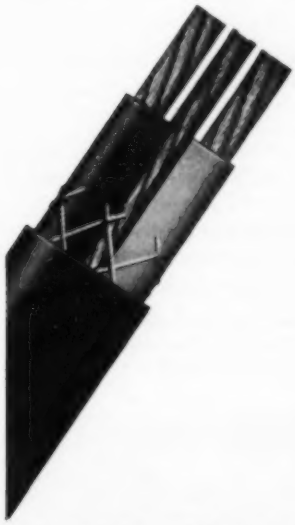
in shuttle car cable

there are no **"lucky"** breaks

-they all cost money!

*...and four or five breaks can equal the cost of the cable in lost production. Since actual records show different makes have widely varying life expectancy, it pays to choose your cable carefully.*

for longer "break-free" service insist on



## Cold Rubber Insulated **Securityflex**

This ANACONDA portable power cable—the first with cold rubber insulation—won't override, kink or twist. New or aged, it has greater resistance to cutting, crushing, impact, abrasion, heat and moisture penetration than other types. It stands up well under reel tension, passes easily over guides, and won't fatigue readily from frequent sharp bends. Patented "anti-short" breaker strip and flat-stranded grounding wire make it the safest known cable for the job.

When cable repairs skyrocket costs so fast, it's poor economy to buy less than the best. A sample length of Securityflex* Shuttle Car Cable will convince you that this super-safe, super-tough cable can speed your production and cut down those "bad" breaks that leave your men and machinery idle too long. Call your nearest Anaconda Sales Office or Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

52256 *Trademark

**the right cable for the job** **ANACONDA®** **wire and cable**

# *in WIRE ROPE, too it takes the RIGHT KIND of muscle*

The long flat muscles of the black panther give him the spring and suppleness he needs to survive in his particular environment. They're ideal for the job they're called upon to perform.

So, too, with wire rope! Specific jobs call for the right kind of muscle; the right construction and lay of the rope; the right grade of steel and size of wire...to best withstand the destructive forces encountered.

Wickwire Rope gives you the benefit of long experience and specialized know-how which assures you of exactly the right kind of rope your particular job demands.

For additional information write or phone our nearest sales office.

THE COLORADO FUEL & IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

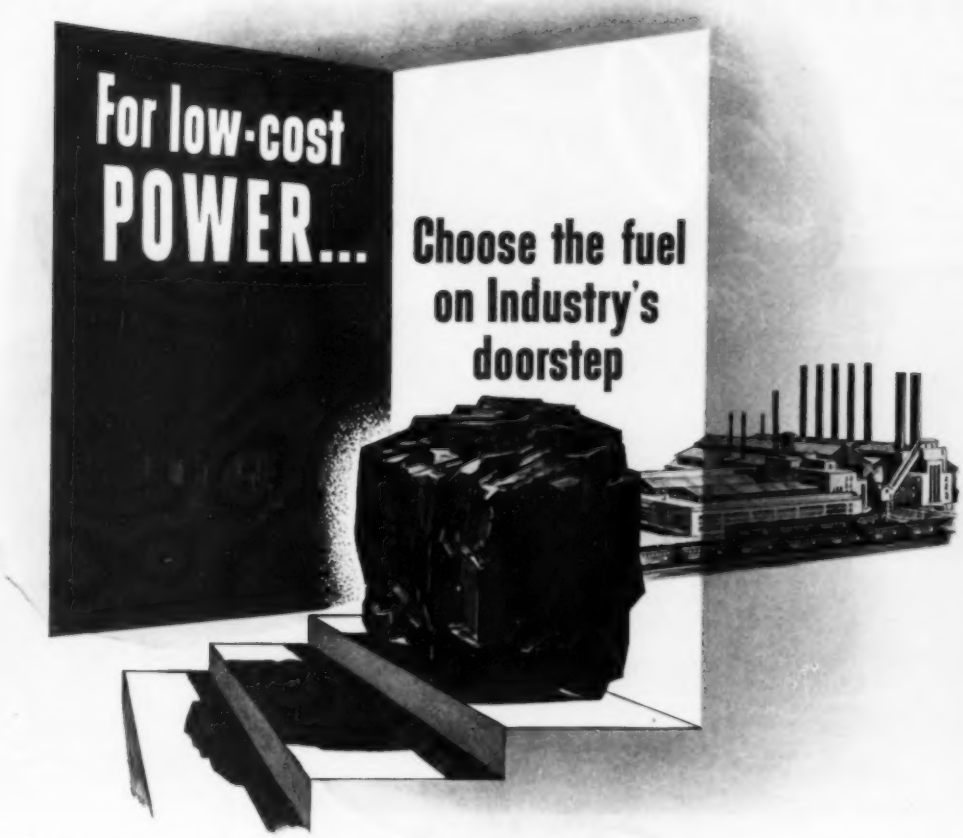
WICKWIRE ROPE
A CF&I PRODUCT

*LOOK FOR THE YELLOW TRIANGLE ON THE REEL*

WICKWIRE ROPE
CF&I
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

# For low-cost POWER...

## Choose the fuel on Industry's doorstep



Coal is where you find it. Fortunately, however, a large share of the nation's operating Bituminous mines are located in Baltimore & Ohio territory—*economically accessible to America's great industrial plants.* The Bituminous mined here—practically on Industry's doorstep—is of excellent quality and in wide variety; whatever your specific need, there are B&O coals to meet it. Furthermore, the supply is *inexhaustible*—you can count on an *unlimited* reserve of B&O Bituminous, even in emergencies, for centuries to come.

When you consider fuel, consider cost—dependability of service—*accessibility.* You'll choose the Bituminous mined on the B&O. For advice, *ask our man!*

**BITUMINOUS COALS FOR EVERY PURPOSE**

LINKING 13 GREAT STATES WITH THE NATION — B&O ®

**BALTIMORE & OHIO RAILROAD**

**Constantly *doing things*—better!**

# CARDOX-HARDSOCG *Surface* AUGER MINERS

## *open up new low-cost tonnage*

At mine after mine, operators are turning to CARDOX-HARDSOCG Surface AugerMiners to recover "dividend" coal. Where the overburden has made conventional stripping prohibitively expensive, they are taking out coal at rates up to 50 tons per man-shift. Costs are usually far less than for the original working.

### *Easy to Set Up—Economical to Use*

This is profitable production. Use of a CARDOX AugerMiner requires no new development work, since it is trucked or towed on its own detachable wheels to the face of the seam. Hydraulic elevator-posts position the unit at the desired height. Augers up to 42" in diameter drill directly into the seam to distances of 100' or more from the face. An integral retriever and a hydraulic hoist make fast and easy the addition or removal of 6' auger extensions.

### *Permits Selective Mining*

Vertical directional-control of the auger keeps it clear of rock or shale. It drills out only good, marketable coal—and you select the size you want by the cutterhead you use. The coal comes out in a mechanized flow, ready for conveyor-loading into trucks—a better quality product, produced at a fraction of the cost of conventional methods.

Get the facts now on how CARDOX-HARDSOCG AugerMiners can restore old mines to new, money-making producers. They are sold and serviced only by experienced CARDOX Engineers. AugerMiners are available in 95 HP and 145 HP models.

Write for the new bulletin that contains full details.

**Hardsocg Division ● CARDOX CORPORATION • 307 North Michigan Avenue, Chicago 1, Illinois**

# HOW BUCYRUS-ERIE DRILLS

## *Cut Preparation Costs*

Bucyrus-Erie blast hole drills cut preparation costs as much as 50 percent, give you better fragmentation. This is how:

**Bigger Holes** — Bucyrus-Erie blast hole drills give you large holes — up to 12-in. — which can be spaced farther apart, requiring less total drilling footage. Also, bigger holes can be loaded easier and faster.

**Heavy strings, shattering blows** — Heavy tool strings plus the sharp hitting action of Bucyrus-Erie drills produce the shattering blows that mean speedy penetration.

**Uniform fragmentation** — With bigger holes, primary blasts usually produce better fragmentation. Less secondary blasting is needed, and the amount of power per ton of rock is about the same as with small holes.

**More actual working time** — Quick moves, with caterpillar mountings, fast setups with built-in leveling jacks, fast tool changes with built-in tool wrenches (except 22-T) mean less time lost, more actual drilling time.

123852

Here are the "big four" of blast hole drills. Write for full details.

| | | |
|---|---|---|
| 22-T | 5⅞" to 6⅝" | holes |
| 27-T | 6" to 6⅝" | holes |
| 29-T | 6" to 9" | holes |
| 42-T | 9" to 12" | holes |

Diesel or electric power is available for all machines . . . gasoline for all except the 42-T.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

# CARDOX-HARDSOCG *Surface* AUGER MINERS

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At mine after mine, operators are turning to CARDOX-HARDSOCG Surface AugerMiners to recover "dividend" coal. Where the overburden has made conventional stripping prohibitively expensive, they are taking out coal at rates up to 50 tons per man-shift. Costs are usually far less than for the original working.

### *Easy to Set Up—Economical to Use*

This is profitable production. Use of a CARDOX AugerMiner requires no new development work, since it is trucked or towed on its own detachable wheels to the face of the seam. Hydraulic elevator-posts position the unit at the desired height. Augers up to 42" in diameter drill directly into the seam to distances of 100' or more from the face. An integral retriever and a hydraulic hoist make fast and easy the addition or removal of 6' auger extensions.

Write for the new bulletin that contains full details.

### *Permits Selective Mining*

Vertical directional-control of the auger keeps it clear of rock or shale. It drills out only good, marketable coal—and you select the size you want by the cutterhead you use. The coal comes out in a mechanized flow, ready for conveyor-loading into trucks—a better quality product, produced at a fraction of the cost of conventional methods.

Get the facts now on how CARDOX-HARDSOCG AugerMiners can restore old mines to new, money-making producers. They are sold and serviced only by experienced CARDOX Engineers. AugerMiners are available in 95 HP and 145 HP models.

**Hardsocg Division ● CARDOX CORPORATION • 307 North Michigan Avenue, Chicago 1, Illinois**

# HOW BUCYRUS-ERIE DRILLS

## *Cut Preparation Costs*

**Bucyrus-Erie blast hole drills cut preparation costs as much as 50 percent, give you better fragmentation. This is how:**

**Bigger Holes** — Bucyrus-Erie blast hole drills give you large holes — up to 12-in. — which can be spaced farther apart, requiring less total drilling footage. Also, bigger holes can be loaded easier and faster.

**Heavy strings, shattering blows** — Heavy tool strings plus the sharp hitting action of Bucyrus-Erie drills produce the shattering blows that mean speedy penetration.

**Uniform fragmentation** — With bigger holes, primary blasts usually produce better fragmentation. Less secondary blasting is needed, and the amount of power per ton of rock is about the same as with small holes.

**More actual working time** — Quick moves, with caterpillar mountings, fast setups with built-in leveling jacks, fast tool changes with built-in tool wrenches (except 22-T) mean less time lost, more actual drilling time.

123852

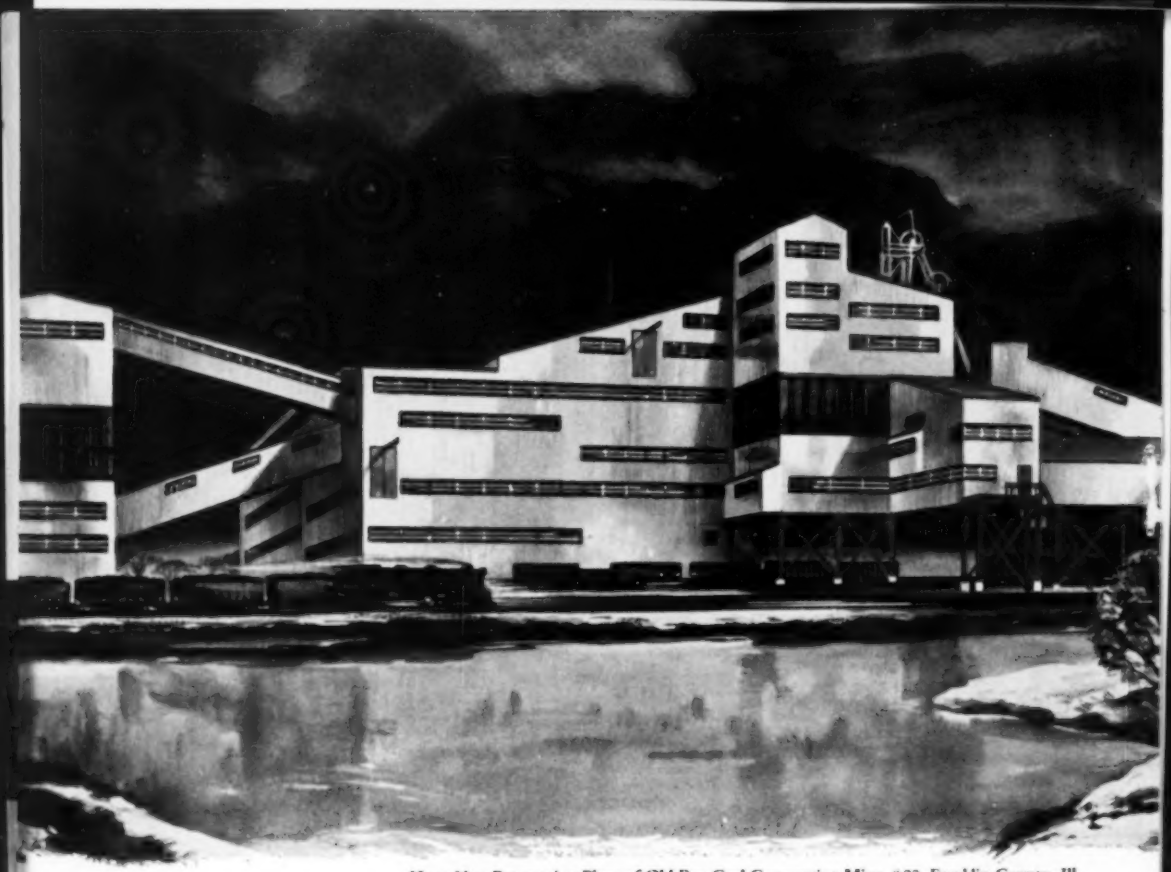
Here are the "big four" of blast hole drills. Write for full details.

| | | |
|---|---|---|
| 22-T | 5⅞" | to 6⅞" holes |
| 27-T | 6" | to 6⅞" holes |
| 29-T | 6" | to 9" holes |
| 42-T | 9" | to 12" holes |

Diesel or electric power is available for all machines . . . gasoline for all except the 42-T.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



Huge New Preparation Plant of Old Ben Coal Corporation Mine #22, Franklin County, Ill.

# COAL APPROACHES *Perfection* . . .

*Yes! That's exactly what this new installation* of the McNally Tromp Heavy Density Cleaning System is doing for Old Ben Coal Corporation at their Mine #22. This new preparation plant is producing quality coal at 850 tons per hour . . . and that's a lot of coal.

*Coal men can see new profit possibilities* in a superior quality fuel for which there is now an unsatisfied demand. The McNally Tromp System, the most positive yet invented to remove impurities and automatically control quality, brings coal *closer to perfection.*

*Industrial users visualize even lower steam costs* and closer standards of boiler room control by firing with this up-graded fuel.

*This new washing system,* its complementary equipment, and the plant to house them have been designed, manufactured, and erected by McNally Pittsburg.

*Consult with us* for better methods to put your operations on a higher basis of performance to meet modern demands.

*The McNally Tromp Heavy Media Bath,* illustrated in a cross-sectional view above on next page, is typical of the equipment installed for cleaning the most difficult coals containing high accumulations of near gravity materials. It is the washing equipment that is bringing coal closer to perfection. It is in full operation at Old Ben Valier Mine.

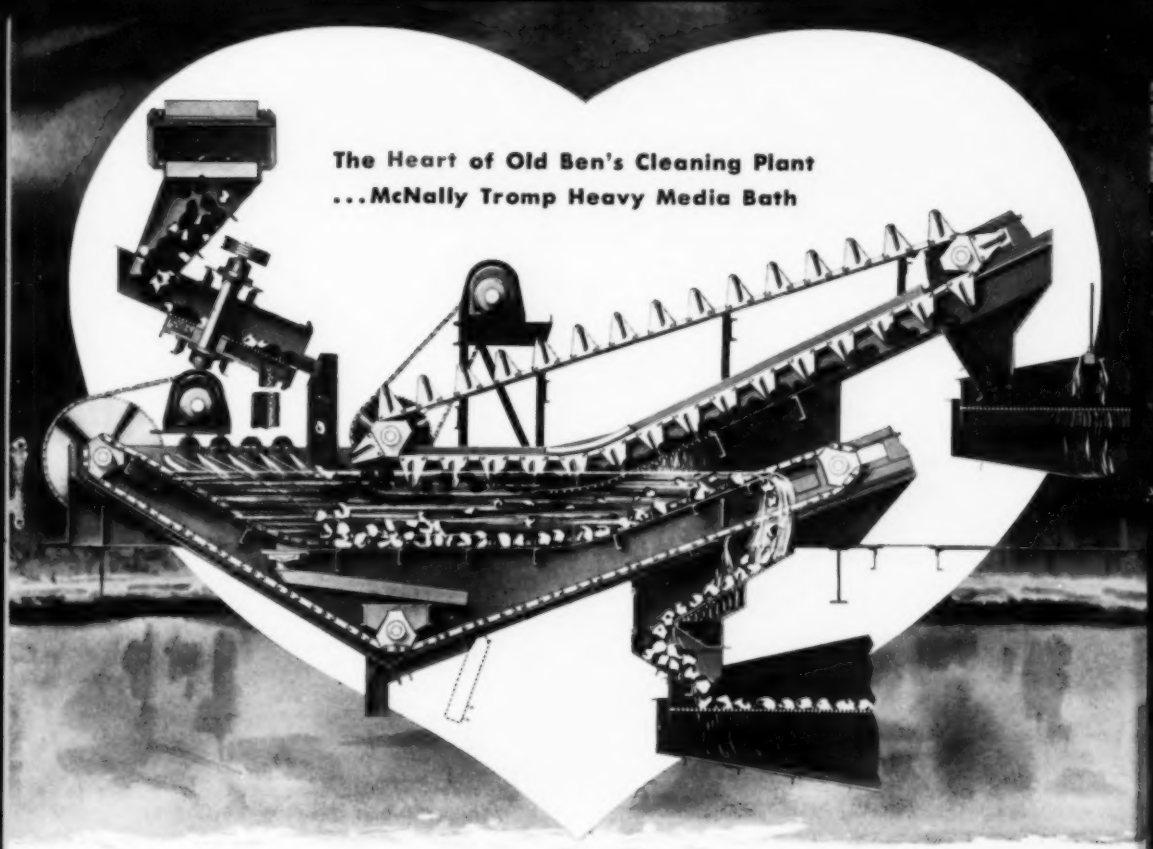
*The Tromp Bath employs the patented Laminar flow principle.* Coal enters the bath at a controlled rate of

** Reproduction of an advertisement with text copy to* (asterisk) substantially as it appeared in Fortune Magazine.*

**McNALLY PITTSBURG**

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation — Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering & Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio




## .....HERE IS THE BATH *that does it!*

discharge from the raw coal conveyor. It moves continuously and slowly through the bath and by flotation the coal rises. Coal, clean coal conveyor, middle gravity particles, dense media solution, and sink conveyor *move at the same speed* through the bath from raw coal inlet towards the discharge end . . . No disturbing upward currents.

*Clean coal is discharged to rinsing screens* while middlings, transported by Laminar flow solution, are intercepted by refuse conveyor near refuse discharge point. They are then discharged along with refuse to the refuse rinsing screens.

*A high accumulation of middle gravity particles will not hamper the efficiency* of the McNally Tromp Dense Media Bath since they are continuously removed from the bath proper.

*This Tromp Bath utilizes* coarse ground magnetite, mill scale, limestone, or other heavy media specific gravity particles which may or may not be recovered by magnetic principle.

*This is the latest washing system added to the McNally line,* which consists of the McNally Norton baum jig, Rheolaveur coarse and fine coal cleaners, McNally Menzies Cone, and the Brusset Vacuum jig dry cleaning system. The Tromp Heavy Media Bath is proven and has long been in use in England, France, and Holland.

*Now you can wash lump down to ¼" at laboratory efficiency.* Investigate the possibilities for cleaning your coal. We will gladly explain the advantages and give you an actual forecast of operating results.

**McNALLY PITTSBURG**
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

*Look to McNally Pittsburg for the New Developments in Coal Cleaning Equipment*

McNally Pittsburg Manufacturing Corporation — Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering & Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

# A NEW SIZE!

# 43 H.P.

## DODGE TORQUE-ARM

**The Speed Reducer that saves you real money!**

Here it is—the big size that enthusiastic Torque-Arm users have been asking for! Engineered for the same dependable performance and same economy that have made Dodge Torque-Arm Speed Reducers a nation-wide sensation.

- The new "big brother" of the famous Torque-Arm family. Double reduction. 43 hp capacity. Output speeds from 12 to 110 rpm.
- Rugged. Dependable. *Economical.* No special engineering required. No foundation to provide. No flexible couplings. No "lining up" difficulties. No expensive installation.
- Stock TAPER-LOCK sheaves prescribed for each job provide desired speeds. Applications to other machines is practical and easy.
- Unit is driven through any V-belt drive. A torque arm, fastened to any fixed object, anchors the reducer unit. Turnbuckle provides fast and accurate adjustment of belt tension.
- Backstop available from stock when required. Easily installed. Sealed and lubricated inside reducer housing.
- Dodge Tri-Matic Overload Release, which provides positive protection for driven machines both mechanically and electrically, is available from stock.
- Dodge Torque-Arm Speed Reducers are built in two series—Single and Double Reduction. Eleven sizes in all, with capacities from 1 to 43 hp and output speeds from 13 to 333 rpm. All available from distributors' stocks.
- WRITE for special Torque-Arm bulletin.

**DODGE MANUFACTURING CORPORATION**
**3000 Union Street • Mishawaka, Indiana**

# DODGE

*of Mishawaka, Ind.*

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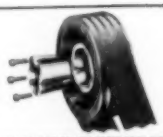
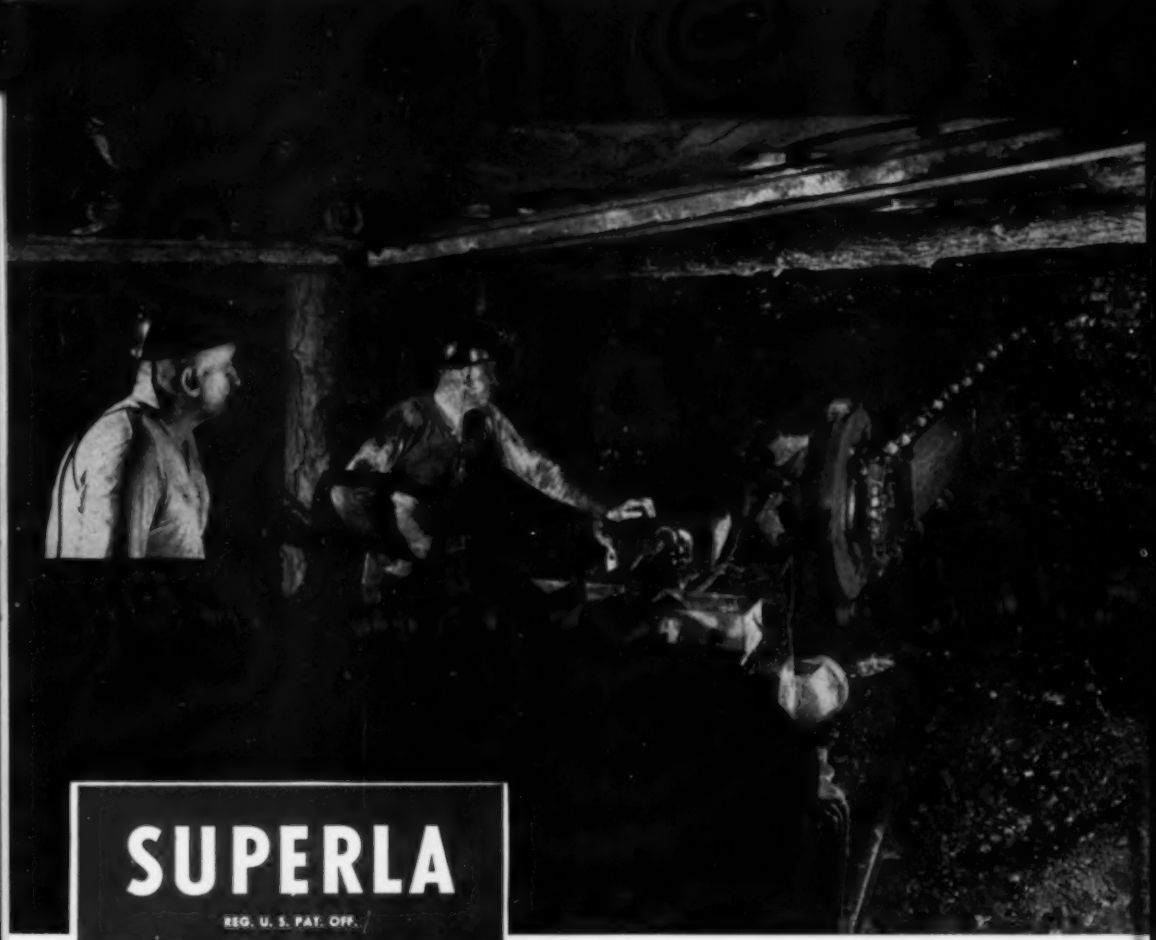
**CALL THE TRANSMISSIONEER,** your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.



SEALED-LIFE V-BELTS AND TAPER-LOCK SHEAVES

DODGE-TIMKEN PILLOW BLOCKS

SOLID STEEL CONVEYOR PULLEYS



# SUPERLA

REG. U. S. PAT. OFF.

## Mine Lubricant No. 0

## Cutting . . . lubrication troubles

● Operators of this midwest mine depend on SUPERLA Mine Lubricant No. 0 for trouble-free lubrication, not only in the gear cases of their three cutters, but in the transmissions of two Goodman loaders as well. This one lubricant, recommended by a Standard Oil lubrication specialist, does both jobs with equal success, and simplifies stocking of lubricants at the mine.

In three years of operation with SUPERLA Mine Lubricant there have been no cases of downtime of loaders or cutters due to faulty lubrication. Wear has been held to a minimum. Warm-up time for the loaders has been eliminated.

SUPERLA Mine Lubricant has cut lubrication troubles in this mine . . . it can do the same in your mine. There's a Standard Oil lubrication specialist located near you who knows mining equipment and how to lubricate it best. He is at your service for on-the-job help on any problem related to lubrication. Why not call on him today? Just contact your nearest Standard Oil office, or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

**STANDARD OIL COMPANY** STANDARD *(Indiana)*

# You Get Safety, Plus Economy, When You ROOF-BOLT

When you install roof bolting, you can count on increased safety and greater all-around economy. For roof bolting not only helps to minimize the possibility of accidents in the mine—it also makes possible increased production, faster transportation, less material-handling and better coal-preparation. Besides, a roof-bolted mine is much easier to ventilate, better to work in.

To enable mine operators to obtain these ideal conditions, Bethlehem manufactures the two types of roof bolts shown here. We make these bolts in a variety of lengths, using new-billet steel. Each bolt can be used vertically or at angles, and is suitable for use with roof plates, roof ties, roof channels, plate washers, and angle washers.

If you would like to have complete information about roof bolting, drop a line to us at Bethlehem, Pa.

### BETHLEHEM SQUARE-HEAD ROOF BOLT

*(Plus Expansion Shell)*

An assembly of special unchamfered square-head rolled-thread ¾-in. bolt, plug, and expansion shell. Bolt has two pressed ears to support shell during anchoring. When bolt is tightened, the plug is pulled down into expansion shell, expanding the leaves of the shell to provide holding power. Small, sharp projections near the top of each leaf make firm contact with the hole, to prevent the shell from turning when the bolt is rotated.

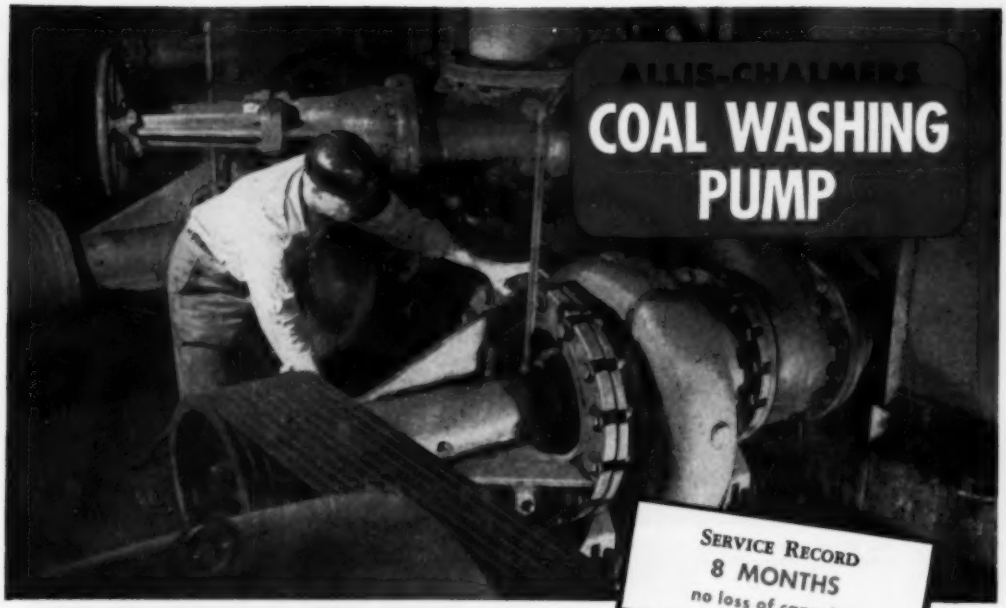
### BETHLEHEM SLOTTED ROOF BOLT

Forged slot accommodates wedge. Slot is automatically centered during an exclusive forging operation which forms the equivalent of two half-rounds. No steel is lost through burning. Opposite end of bolt has 5 in. of 1-in. rolled threads. When inserted to back of hole, wedge is forced deep into slot, expanding bolt ends to provide tight grip. Bolt has truncated cone point, to prevent damage to threads. It is generally furnished with American Standard Regular Square Nut.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

## BETHLEHEM MINE ROOF BOLTS




SERVICE RECORD
8 MONTHS
no loss of capacity

SERVICE RECORD
9 MONTHS
2 and 3 shifts—new impeller

SERVICE RECORD
10 MONTHS
no parts replaced

SERVICE RECORD
13 MONTHS
first part replacement

# LONG LIFE... LOW COST OPERATION

## Proved By Service Records

ACTUAL SERVICE RECORDS FROM COAL PREPARATION PLANTS show Allis-Chalmers Coal Washing Pumps last longer than other types of pumps that sometimes last only 2 or 3 weeks in preparation plant service. These are just a few of many operators' reports proving exceptionally long life and low cost per gallon pumped or ton handled.

### HERE'S WHY

Allis-Chalmers Coal Washing Pumps have established these fine records because they are made of a special hard alloy, *Allisite* . . . because they are built with extra strong parts and extra thicknesses of metal in critical spots . . . because they are application engineered by men who know coal handling equipment problems.

When replacement finally does become necessary, the Allis-Chalmers Coal Washing Pump is easy to tear down and reassemble. Wearing parts are separated into easy-to-handle units. Piping need not be disturbed.

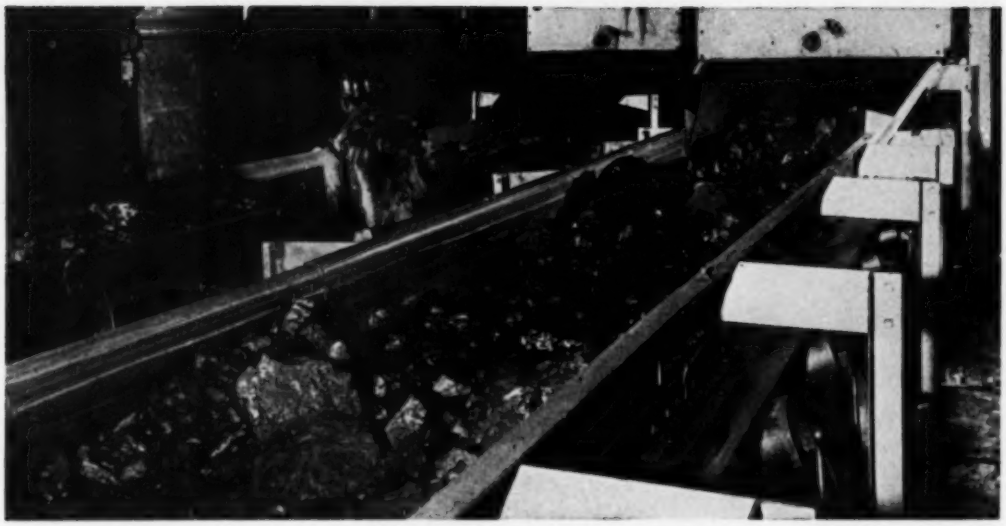
Next time you need a coal washing pump, call your Allis-Chalmers Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin and ask for bulletin 08B6381. A-3695

**Only 5 Wearing Parts**

Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

*Allisite* is ⌐ Allis-Chalmers trademark.

# ALLIS-CHALMERS



Belt conveyor in foreground carries coal from car dump hopper in headhouse of a coal preparation plant to the screen house, where any rock is removed from lump coal. By-pass conveyor in background carries away mine rock.

# Rely on one source... one responsibility for the best in belt conveyors

## LINK-BELT engineering experience plus quality components combine to cut handling costs

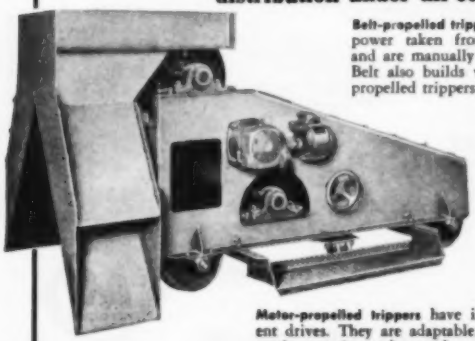
WHETHER you must move a few tons a day or several thousand tons per hour . . . whether the haul is measured in feet or miles—you'll find the answer in belt conveyors at Link-Belt.

Here's a nation-wide engineering organization that will follow through from start to finish—the designing, manufacturing, erecting of conveying equipment. And nowhere can you match Link-Belt's combination of vast application experience . . . complete line of quality components . . . expert coordination of related equipment.

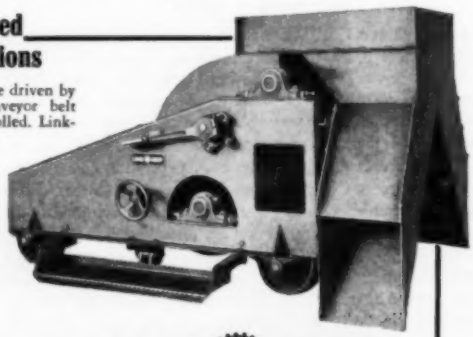
Get all the facts from the Link-Belt office near you. Link-Belt engineers are glad to work with you and your consultants—help you get the finest in belt conveyors.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, Duluth, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

## LINK-BELT Trippers offer controlled distribution under all conditions



**Belt-propelled trippers** are driven by power taken from conveyor belt and are manually controlled. Link-Belt also builds winch-propelled trippers.



**Motor-propelled trippers** have independent drives. They are adaptable to automatic operation and control.

12,880-A

LINK-BELT

BELT CONVEYOR EQUIPMENT

# You're looking at GUARANTEED top efficiency in coal cleaning and preparation!

**EFFICIENT OPERATION** — Records from mine after mine show 99%+ separating efficiency!

**LOWEST OPERATING COSTS** — Production records show cost per ton of coal cleaned to be consistently lower than any other system!

**EXTRA WIDE SIZE RANGE** — ⅛" to 10"—PLUS ability to handle coal at operating gravities from 1.35 to 1.65. Washing gravity change-over on Chance Sand Flotation system can be made in five minutes by one man.

"Fairmont-Built" *GUARANTEED* plants can be designed in sizes ranging from 40 tons per hour up to any desired capacity, to suit your individual requirements. For help or advice on your coal preparation problems, call on the FAIRMONT ENGINEERS.

## FAIRMONT MACHINERY COMPANY

**Fairmont, West Virginia**

Designers and Constructors of Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning

# What sets a good rope apart?

Most wire ropes of the same size and type look pretty much alike—at least when they're new.

But there are differences that soon begin to tell . . . on the really tough jobs.

The carefully-made rope can take the beating. As time goes on, the steel in its wires shows high resistance to wear. The strands remain in alignment. There's little or no distortion. Maybe the rope has been handicapped by small sheaves and drums, but it hasn't broken down under the pressures.

Those are some of the things that set a quality rope apart. They are not the result of chance, but of fine ingredients, expert engineering, and that extra ounce of care at every step of manufacture. They are the things that make Bethlehem wire rope a superior product . . . one that fully merits your trust when the going is tough.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

***When you think WIRE ROPE . . . think BETHLEHEM***

# THIS Goodman LOCOMOTIVE in a single or tandem operation will put "GO" in your haulage system

**As a single unit for initial and intermediate haulage, in tandem hookup as length of hauls increase, this locomotive gives the performance it takes to keep pace with mine expansion.**

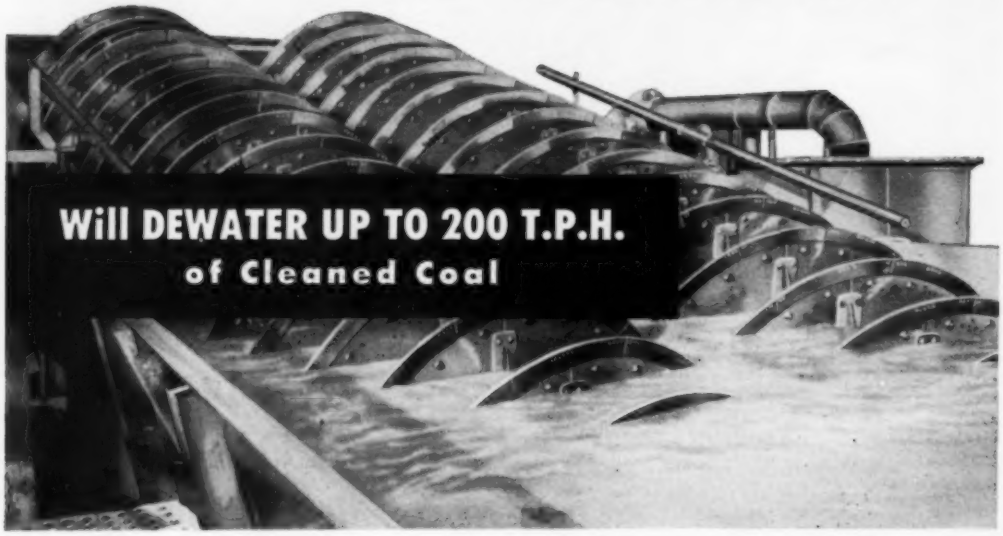
**Whether you eventually buy two or twenty, you will find them as alike as peas in a pod. With ANY TWO hooked in tandem, there is full operating control from either cab. Plenty of room, and safety too, for the motorman and trip rider.**

**At the 1952 Coal Show in Cincinnati, May 5-6-7, you are cordially invited to visit Goodman headquarters in the Netherland Plaza Hotel.**

**More than enough power for the job today**
**Fully adequate for the bigger job tomorrow**

**Goodman MANUFACTURING COMPANY**
HALSTED STREET at 48th • CHICAGO 9, ILLINOIS

# ONE AKINS CLASSIFIER




This is the world's largest spiral dewatering classifier. It is a 66" duplex Type S Akins and is desliming and dewatering phosphate flotation feed. Such a machine would have a capacity of 120 T.P.H. of coal—sizes up to 78" duplexes are available for higher capacities, up to 200 T.P.H.

Akins Classifiers and Dewaterers are efficient and extremely economical to operate in any size. The slow, continuous operation of the spiral assures minimum wear and maintenance cost — no sprocket or pin wear. The wearing surfaces of the conveying mechanism are protected by easily replaceable abrasion-resistant shoes. These features offer freedom from breakdown and upkeep difficulties common with other dewatering equipment.

Whatever capacity you require, there is an Akins to suit your operation more economically than any other dewatering equipment.

COLORADO IRON WORKS CO.

*Use the Coupon*

Our CIW engineers are at your service on any separation or dewatering application. Give as much information as possible in writing.

•

Ninety Years' Service to Mining
1860 — 1950

**COLORADO IRON WORKS CO.**
**1626 17th St.** **Denver, Colo.**

Please send me your Bulletin No. 49 on coal cleaning.
I am interested in: ☐ Low cost dewatering equipment
☐ High capacity HMS cleaning equipment.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____

1 BETTER QUALITY COAL

2 LESS HAND LABOR

3 MORE COAL PER DOLLAR

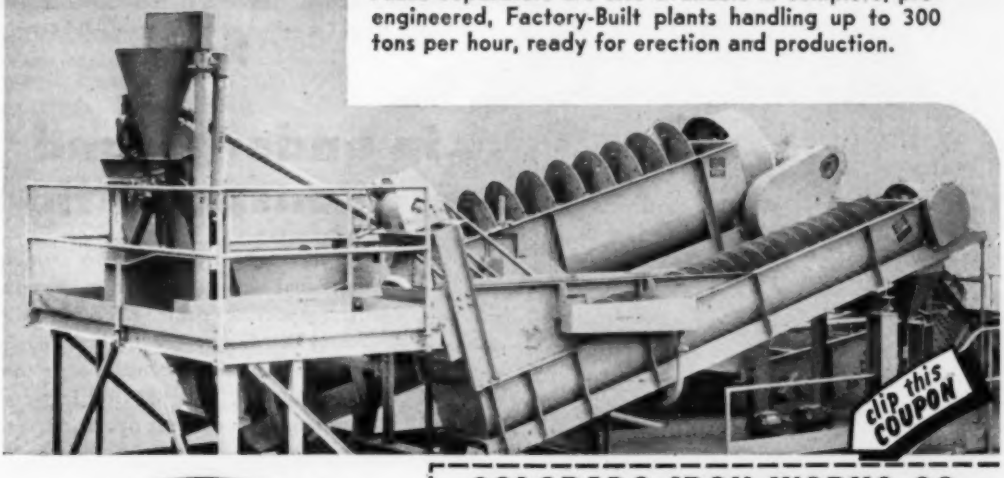
4 EASIER MECHANIZATION

# With an AKINS HMS SEPARATORY VESSEL

Whatever your tonnage—whatever your present cleaning methods—you can improve your output and cut your costs by adding an AKINS SEPARATOR installation to your preparation plant. The Akins Separator makes a three-product (sink, float and middlings) separation in one step. Use the middlings to grade your coal to your market, or use them to fire your own boilers for heat and power.

It will pay you to replace your existing separatory vessel with an Akins Separator and take advantage of the three-product separation.

Installed costs for the Akins are low. Get complete information now. Write for CIW Bulletin No. 49. Akins Separators are also available in complete, pre-engineered, Factory-Built plants handling up to 300 tons per hour, ready for erection and production.




COLORADO IRON WORKS CO.

DENVER 2, COLORADO

•

Ninety Years' Service to Mining
1860 — 1950

## COLORADO IRON WORKS CO.

1626 17th St. • Denver 2, Colo.

Please send me your free Bulletin No. 49. I am interested in:

☐ Replacing or supplementing our existing cleaning equipment

☐ Original cleaning equipment

☐ Factory-Built equipment to handle up to 300 tons per hour total feed

NAME

TITLE

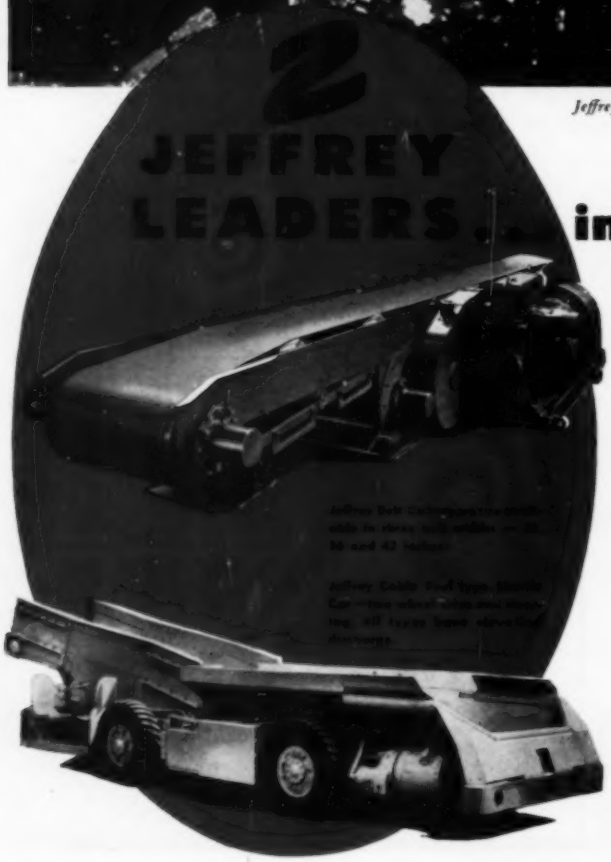
COMPANY

ADDRESS

For Mining Operations Below Ground

# *Use* JEFFREY

*Jeffrey Shuttle Car discharging into the end of a Belt Conveyor. Coal is kept on the move.*




## in underground transportation

On this page we show two modern units that have proved most effective in transporting coal from face to tipple. Jeffrey Belt Conveyors for intermediate and main haulage handle large tonnages rapidly and provide low-cost maintenance—efficient operation.

Jeffrey Shuttle Cars, operating between the loader and conveyor, have come about as close to continuous production as most systems developed to date. This combination actually turns out more coal per shift at lower cost per ton than most methods. These cars are available in cable reel types with either two or four wheel drive and steering. Capacities—from 3.75 to 7.75 tons.

and Coal Preparation Topground

# EQUIPMENT

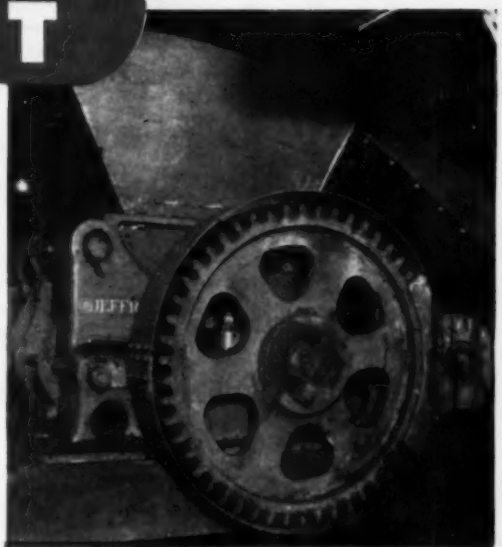
## JEFFREY CRUSHERS for COAL MINES

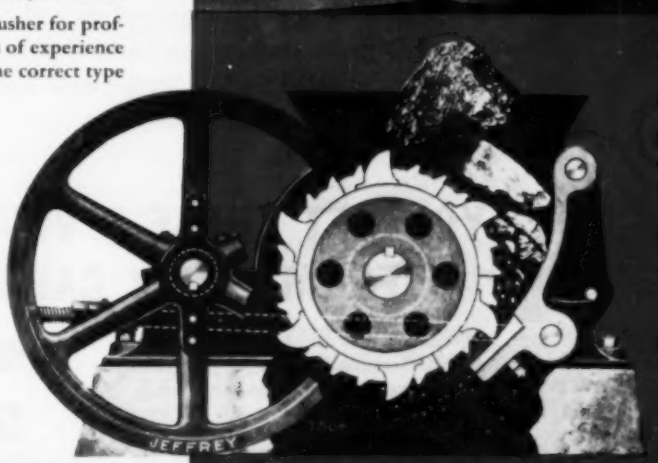
Today more than ever it is essential to reduce coal to marketable sizes to meet customers' needs adequately. Jeffrey Crushers enable coal mines to meet each new demand for a uniform stoker coal and to dispose of surplus lump by reducing it to acceptable sizes.

***Maximum size of feed • Size of product required***
***Kind of coal • Size of fines that are objectionable***

...ALL have a bearing on type of crusher for profitable operation. More than 65 years of experience enable Jeffrey Engineers to specify the correct type of unit for greatest profit, whether it be Single Roll, Double Roll or a FLEXTOOTH Crusher.

Details of construction and application to your requirements are readily available by calling in a Jeffrey Sales Engineer. *Do it today.*






**TOP** — *shown is a Jeffrey 30" x 60" single roll crusher installed in a Kentucky mine and used for reducing entire output to desired sizes.*

**RIGHT** — *a cross-section view of the Jeffrey Single Roll Crusher. Also Double Roll, FLEXTOOTH and FLEXROLL Crushers in a wide range of sizes.*

THE JEFFREY MANUFACTURING COMPANY

912 North Fourth St., Columbus 16, Ohio

Established 1877

1877 75 1952

## Accept no more substitutes!

Now, you can again get genuine Carboloy Coal Mining Tools. As fast as Carboloy quality production methods permit, we are rushing new stocks to your Carboloy Distributor. Check your needs; then see him. He will be glad to cooperate in every way in filling your needs.

# Cut more coal per shift, with Carboloy Coal

You beat down profit-eating tool costs per ton. You save money in almost every operation directly dependent on coal cutting when you choose mine-proved Carboloy Coal Mining Tools. Designed right, built right—of genuine Carboloy Cemented Carbide, *hardest metal made by man*—to give you the last word in cutting-tool performance.

## YOU GET THESE 7 VITAL ADVANTAGES FROM EVERY CARBOLOY TOOL

**1** Carboloy Coal Mining Tools will cut more coal for you per shift than *any* others will under the same conditions.

**2** They stay sharper far longer between grinds; materially cut time wasted in bit changing. (They keep costly machinery working more of the time, bring down equipment cost assigned to each ton of coal; help men be more productive, help reduce labor cost per ton.)

**3** They give you longest possible tool life.

**4** Take more regrinds per tool.

**5** They need less power.

**6** Put less wear and tear on vital machinery, make clean, shattering cuts.

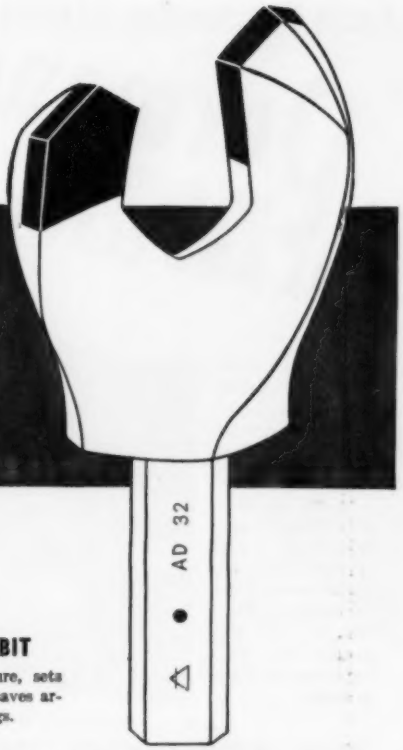
**7** Require much less reconditioning time when finally worn.

•

*Let us send you any information you might want on any Carboloy Coal Mining Tool.*

SPECIFY CARBOLOY, THE QUALITY

# *cut costs more*
# *Mining Tools*



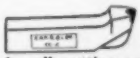

## FREE SERVICE PROGRAM HELPS CUT COSTS

To help you get from Carboloy Coal Mining Tools everything we build into them, we offer these free services:

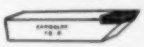
- Complete, tuition-free training course for your key personnel. Features: instruction, demonstrations, correct grinding practices. Special discussions with your men on cemented carbides in relation to most efficient coal mining under *your* setup.
- Assistance and advice of qualified Carboloy Field Engineers and your local Carboloy Distributor.
- Clear, concise maintenance-instruction manual and Catalog No. CM-100.

Write us direct for any information on any of these services.

**AUGER DRILL BIT**
requires less pressure, sets up less vibration, saves armatures and bearings.



**CC-2 COAL CUTTER BIT**
for all cutting machines, including continuous types, that use ½" by 1" bits.



**FINGER BIT**
for strip or underground mining. Does amazing job of gouging.

**TWO-PRONG ROOF BOLTING DRILL**
for drilling through softer rock, such as shale, bony, and laminated sandstone.

**SOLID ROOF BOLTING DRILL**
for drilling in hard slate, hard shale, laminated limestone, and massive sandstone.

"Carboloy" is the trademark for the products of Carboloy Department of General Electric Company

# CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY
11120 E. 8 Mile Street • Detroit 32, Michigan

BRAND OF COAL MINING TOOLS

## Again Outstanding DESIGN for New Speed and Economy in Drilling

# Parmanco

### MODEL 51 • SELF-PROPELLED • HYDRAULIC

# COAL AND CLAY DRILL

This Model 51, one-man operated drill, adds another unit to the top performing PARMANCO line of drilling machines.

An example of its great value is seen in its ability to drill 2½-inch holes at a speed up to 7 feet per minute in No. 5 coal. It will also handle 4¼ - inch augers up to 25 feet in depth.

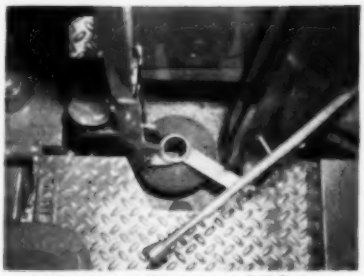
• Hydraulic Feed • Finger-Tip Controlled • Fluid Motor for Auger Rotation

4 Jacks and Power Winch optional at extra cost.

Above

## New Automatic CUTTINGS SHIELD and GUIDE

Model 51 is equipped with the newly perfected Automatic Drill-Cuttings Shield and Guide. Now blast holes are kept absolutely clean from cuttings. Note in picture how a dam is formed about the blast hole, excluding casual surface water.



Looking down on New Automatic Drill-Cuttings Shield and Guide located at the right of driver's seat.

**Send for Complete Details**

**PARIS MANUFACTURING COMPANY • PARIS, ILLINOIS**

Thermoid
Industrial
Rubber Products
Quality Value Service

**Hose built for the job!** That's the reason for Thermoid's excellent reputation among users of hose.

Our customers know they can rely on Thermoid's recommendations . . . whether it's for air, suction, hydraulic, welding—or any of the many types of Thermoid hose built for the coal mining industry.

And men who buy these quality products like the service they get from Thermoid's experienced distributors and sales representatives—and their intimate knowledge of the *buyer's* problems.

Get the hose built for *your* job. Specify Thermoid.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

# NOW... SCREEN FINE, MOIST MATERIALS Without Blinding!

ALLIS-CHALMERS
**THERMO-DECK Heating Unit**

**NO "TIME OUT"** to clear fine or medium mesh screen cloth! You can screen fine, moist non-combustible materials *continuously* with new *Thermo-Deck* heating unit.

**INCREASED CAPACITY!** Heated screen cloth *remains* open, permitting more tonnage through the screen and better separation.

**LOWER COSTS!** Operating records show that heated screen cloth lasts up to three times as long when cloth does not have to be pounded free of blinding material. The *Thermo-Deck* heating unit can be easily applied in the field. Your nearby A-C representative can give you more details. Allis-Chalmers, Milwaukee 1, Wisconsin.

**POWER ON** — *Thermo-Deck* heating unit keeps screen cloth clear on screen handling fine, moist material.

**POWER OFF** — Troublesome blinding results on same screen when *Thermo-Deck* heating unit is turned off.

## Send for...

New 8-page bulletin containing complete facts on operation and application of the *Thermo-Deck* heating unit.

**Bulletin 07B7812**

A-3619

*Thermo-Deck* is an Allis-Chalmers trademark.

# ALLIS-CHALMERS

**Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.**

Pulverator

Jaw Crushers

Gyratory Crushers

Grinding Mills

Vibrating Screens

Kilns, Coolers, Dryers

## Cold Test

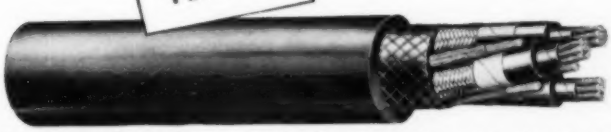
Exposure to sub-Arctic temperature is one of the ordeals these cables must undergo to prove their qualifications. The cables are conditioned for one week at -70° F. and, while at this temperature, bent around a mandrel having a diameter three times that of the cable for cables .55" and less in diameter. Larger cables are bent to greater diameters. This is one of the most severe ways of testing U. S. Royals.

SAFETY TESTED

# U. S. ROYAL CABLES ARE COLD RESISTANT

**7 reasons why U. S. Royal Cables mean safety:**

Seven grueling laboratory tests, each of them tougher than actual conditions, guarantee U. S. Royal's resistance to moisture, abrasion, cutting, heat, cold, impact, flexing. United States Rubber engineers spare no effort in making sure U. S. Royal is a completely safe electrical cable. Write for your free copy of valuable booklet on mining cables to address below.



U. S. Royal Shielded Portable Cable Type SH-D

Products of U.S.RUBBER SERVING THROUGH SCIENCE

**UNITED STATES RUBBER COMPANY**

ELECTRICAL WIRE AND CABLE DEPARTMENT • ROCKEFELLER CENTER, NEW YORK 20, NEW YORK

*When considering a cleaning plant remember this all-important fact:*

# EVERY EXTRA TON PER HOUR

# adds $20,000 a year to profits

In spirited discussions of methods, machines and coal-cleaning theory, it's easy to forget fundamentals. But when all is said and done, this all-important fact is inescapable:

> On every ton you lose to refuse, you lose three ways: The out-of-pocket cost of cutting, loading and hauling underground *plus* the cost of conveying, crushing, screening and cleaning above ground *plus* the income you would have had by shipping it.

Conservatively, at today's costs, just one ton an hour "less float in the sink" adds $20,000 a year to profit. That's an 8% return on a quarter-million dollar investment. ***Compared to the annual profit at stake, the additional cost of installing and operating a true Heavy-Media Separation plant is small potatoes indeed.***

How much more efficiently does true Heavy-Media Separation recover shipping-grade coal? Let's look at the record.

The test of a process is its performance at rated capacity on tough cleaning jobs . . . on enough tonnage from enough seams for a long enough period to supplant theory with solid fact. By that test, the efficiency of true Heavy-Media Separation is beyond question.

AMERICAN *Cyanamid* COMPANY

Built and building are 55 Heavy-Media Separation cleaning plants with a combined feed-rate capacity *of 10,000 tons per hour.* Scattered from Alberta to Alabama, these plants are on widely diverse seams. They clean widely different feeds under all sorts of operating conditions. Some are relatively small "package plants" under the watchful eyes of individual owners. Others are giant installations by the industry's largest operators.

*Most significant, over 1000 tons per hour of Heavy-Media Separation capacity has been installed solely to clean middlings and refuse from other washers and from dumps. These plants operate commercially on what other methods lose to refuse!*

Obviously, if true Heavy-Media Separation functions so efficiently on refuse and feed containing a high percentage of near-gravity material, there can be no question as to its ability to recover that last ton of marketable coal from less difficult feeds.

Heavy-Media Separation is no longer new or experimental. It is the tonnage-tested way to closely duplicate your washability curves in commercial operation. Before you decide on any separation method for a new cleaning plant or to supplement your present facilities, it will pay you to inspect operating Heavy-Media Separation plants . . . to make a comparative study of the better over-all grade and recovery . . . to compare capital and operating costs with the higher profits attainable.

As Technical and Sales Representative for Heavy-Media Separation Processes, we stand ready to give you every possible assistance in making a realistic, profitable decision on your next cleaning plant. We can run carload tests on your coal in the Heavy-Media Semi-Commercial Plant at Stamford, Conn. Although we do not design or build plants, we can put you in touch with experienced engineering-construction firms who do, including builders of pre-fabricated plants with capacities up to 400 tons per hour. We will work closely with your staff or engineers of your choice in the design and initial operation of your Heavy-Media Separation Unit.

**MINERAL DRESSING NOTES #18 "COAL PREPARATION"**

This informative 36-page book, clearly and concisely explains the fundamental principles of the Heavy-Media Separation method. With photomicrographs of medium samples from an operating plant, it shows how Heavy-Media Separation employs unique and exclusive applications of magnetomotive force to provide constant control, conditioning and recovery of the medium. It describes typical operating plants, contains test results, flow schemes and other new useful data. Write for your copy without obligation.

MINERAL DRESSING DIVISION, 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

# BOWDIL PRODUCTS

## HELP YOU GET MORE $$$ FROM THAT MINE OF YOURS

### NEW TELESCOPING TRANSIT SUPPORT

For use in all types deep mining, especially efficient for conveyor mining. As rigid as a prop, sturdily constructed of aluminum and stainless steel. Lightweight, easily, quickly sets up correct height for transit. Main column graduated on 2 sides in 1/100 foot.
Three standard lengths telescoping from 3 to 5 ft., 5 to 8 ft., and 8 to 12 ft. in height. Special lengths furnished on request.

### BOWDIL BITS

Patented concave design increases bit clearance, assures longer wear without increased power consumption. Made from special steel, rolled, with concave faces. Tests in hundreds of mines have proven these Bits last 15% to 20% longer. Bowdil makes the right size and shape bit for every mining condition, to fit all types of chain.

### BOWDIL CUTTER BAR

Bowdil Cutter Bars are designed for extra strength and power saving. Rivet-free body, Z bar construction, wide wearing strips make it the sturdiest bar in mining. Bowdil Bars are standardized to fit all coal mining machines.

### FABRI-FORGE CHAIN

Lower your operating costs with Bowdil Fabri-Forged Chain. Rugged, easy to maintain, the drop-forged lug body stands up under heavy wear with breakage practically eliminated. A major improvement is the true-running radial track guide.

### BOWDIL FAST ROPE SOCKET

You can save time with the Bowdil Rope Socket . . . takes just two minutes to install. No tools necessary. High tensile-strength steel and patented design give maximum strength.

### REPLACEABLE POINT MINER'S PICK

With a Bowdil Miner's pick, it only takes a few seconds to replace a dull, blunted point with a sharp one. Light or heavy, Bowdil pick heads are perfectly designed for weight and balance, come with or without wood handle.

### ALLOY STEEL AUGERS AND DRILL BITS

Uniform temper and shape eliminate almost all possibility of "grabbing." The use of special heat-treated alloy steels not only makes them last longer, but adds an important safety factor.

### BOWDIL DRILL BITS

Any bit requirements can be met from Bowdil's complete line. Fish-tail auger bits, four-point auger bits and two-point clay bits are available in a number of different sizes . . . all made from Bowdil's specially treated steel for long and efficient service.

### DETACHABLE JAW SPIKE PULLER

Small, easy to handle . . . pays for itself many times over. Detachable jaws make it possible to replace claws without delay. The special construction pulls spikes without bending them.

### SPROCKETS FOR ALL MINING MACHINES

Bowdil Sprockets are made from special heat-treated alloy steel and designed for hard wear. Our stock of over 100 different styles includes clutch, spline and keyed types—various tooth designs of 4 to 13 teeth.

### WANT SOMETHING SPECIAL? BOWDIL CAN BUILD IT

Bowdil has the staff and facilities to work with you on any custom building or rebuilding, engineering, machining, fabricating. Excellent heat-treat equipment. If you have a problem, bring it to Bowdil.

BATTERY OPERATED MINE LOCOMOTIVE
DESIGNED AND BUILT BY BOWDIL

**SALES ENGINEERS IN**—Whitesburg, Kentucky—West Frankfort, Illinois Charleroi, Pennsylvania — Denver, Colorado — Big Stone Gap, Virginia Danville, West Virginia — Canton, Ohio — Birmingham, Alabama Helper, Utah—Kansas City, Missouri—Centerville, Iowa—Topeka, Kansas New Castle, England — Alberta, Canada

**SALES AGENTS FOR** *The Cincinnati* **ELECTRIC DRILL**

**BOWDIL**
COAL CUTTING EQUIPMENT
CANTON OHIO

# Gates V-Belts are chosen to keep HELICOPTERS aloft!

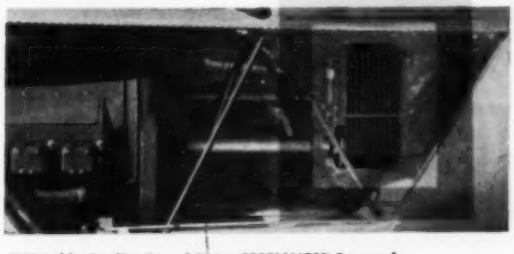
**McCulloch Tandem-Rotor Helicopter**

(Above) Two-place helicopter employs tandem-mounted, intermeshing rotors—a total of six rotor blades—powered by a 200-hp, six-cyl., aircooled horizontal engine installed at the rear. (Lower left) Gates-engineered V-BELTS, shown to rear of the engine, transmit power from the engine to the main drive shaft which in turn drives the reduction gearing for the rotors.

**Because a helicopter is air-borne entirely by the turning of its rotors, McCulloch Engineers who designed this helicopter and supply it to the Navy had to be sure that the drive to the rotors was, above all, safe and reliable—a drive that would not fail when the helicopter was in the air.**

The special difficulty in designing this drive was the extreme *compactness* required.

On small diameter pulleys and short center distances, the drive must handle 200 horsepower for 1000 hours at cruising speed and 500 hours at high speed. Ordinarily, it would have been impossible to achieve these results.



***A Notable Application of Gates SPECIALIZED Research***

However, Gates had developed a V-Belt which in thousands of applications had proved to have the exact characteristics required for this helicopter drive—and Gates had also developed design data which showed at once the applicability of this belt.

It was not by accident, therefore, that Gates Engineers were at once prepared to supply a V-Belt capable of handling this most exacting assignment and —in close co-operation with McCulloch Engineers—they developed the drive shown which has most successfully met all requirements.

Gates readiness to meet successfully *any* V-Belt Drive assignment is possible because Gates runs an *average* of 32,000 hours of testing *every week* on V-Belts alone! (32,000 hours is equivalent to *five years* of life for one belt.)

And the real value to you of such exhaustive testing is this: Laboratory findings are carefully checked by tests made under actual field conditions and the *results* are at once reduced to *usable data* for the design of V-Belt Drives to *perform whatever task may be required!*

## *Phone for a Gates Field Engineer*

If you have a difficult drive to design, or if some drive in your plant is giving trouble, or if you only want to be sure what size and construction of V-Belts will give the most efficient and the lowest cost service on any particular drive—you have only to phone a Gates Field Engineer, *always near you* in all industrial centers.

Just look in your phone book under "Gates Rubber." A Gates Field Engineer will come right to your plant and put at your service the full benefits of Gates V-Belt knowledge and experience *without the slightest obligation!*

ENG-522

Gates VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

THE GATES RUBBER COMPANY

DENVER, U. S. A.

*The World's Largest Makers of V-Belts*

# Grandpa Never Threw a Thing Away

It's only human to want to hold on to things after they've outlived their usefulness. That's why today millions of tons of worn-out and obsolete equipment and machinery are lying forgotten in the country's plants and factories and on farms.

The steel industry needs these millions of tons of dormant scrap, needs it in the worst way. With this vital dormant scrap the entire steel supply picture would brighten up, with more steel for everybody. But without it, the steel industry cannot hope to keep up production at present levels.

Call in a scrap dealer now, today. He will buy your dormant scrap and start it moving toward the steel mills.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

## More Scrap Today... More Steel Tomorrow

# CUT LUBRICATION COSTS with this ONE Multi-Purpose Grease!

*"Using LITHOLINE® saves several greases and guns!"*

Now you can do all lubricating jobs just as well *if not better* with one grease and one gun, using Sinclair LITHOLINE.

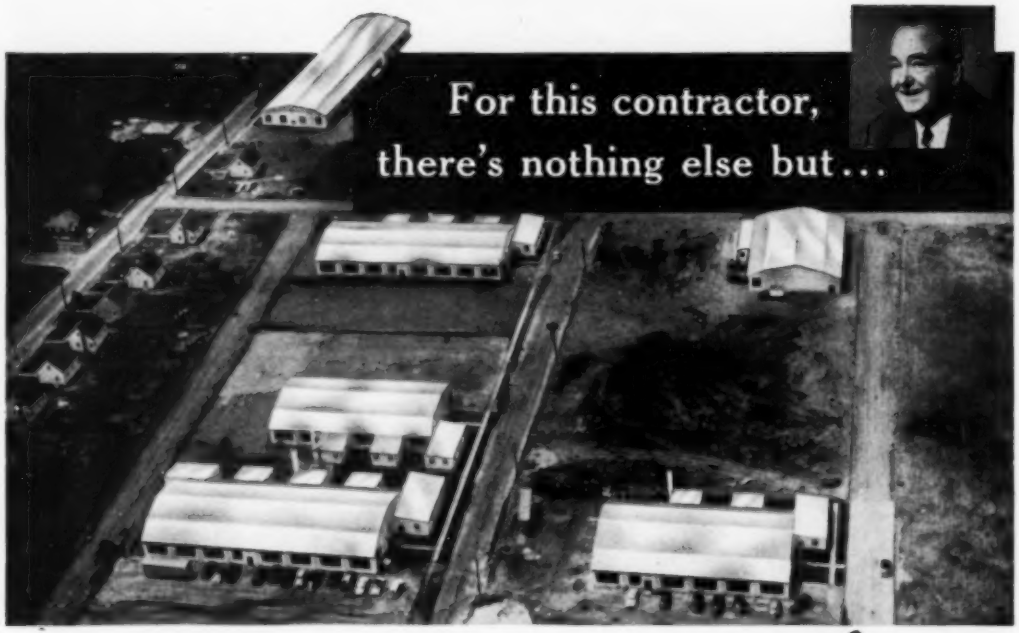
Using Sinclair LITHOLINE is the modern, fool-proof, money-saving way to handle all your lubrication jobs. LITHOLINE converts servicing time into production time.

**ADVANTAGES OF LITHOLINE over specialized greases:**

- SUPERIOR LUBRICATION AT EVERY POINT
- No danger of costly misapplication
- Quicker servicing, less downtime
- Smaller grease inventories
- Fewer dispensing units
- Less chance of contamination
- Less waste
- Simplified purchasing and distribution

Send for free folder describing demonstrations showing superiority of LITHOLINE. Write to your nearest Supplier of Sinclair Products or direct to Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.

## SINCLAIR LITHOLINE *for every lubrication job*




George Mole has been a contractor and industrial building owner in the Amityville, Long Island, area for 25 years. He discovered Reynolds *Lifetime* Aluminum Industrial Corrugated in 1949. He put his first 15,000 square feet on the Amityville School... then used it on the Copiague and Lindenhurst schools and on 13 other industrial and commercial buildings. Let him tell you why:

"First of all economy. Initial cost is low. The insulation value means still more economy, as well as more comfort inside. Low maintenance and long life extend economy through the years. And lighter weight (56 pounds per square) can save on construction.

"My Reynolds .032 roofs have set a standard in this area that I am proud of. I have more buildings planned, and if I can't get this roofing I won't build—that's how sold on Aluminum I am."

**Call Reynolds for literature and technical assistance... offices in principal cities. Check your classified phone book for our listing under "Building Materials" or write to Reynolds Metals Company, Building Products Division, 2041 South Ninth Street, Louisville, Kentucky.**

**Specifications:**

Thickness .032"
Corrugations 7/8" deep, 2-2/3" crown to crown
Uniform load support (roof) 80 p.s.f. on 4' purlin spacing
Roofing width 35", coverage 32"
Lengths 5', 6', 7', 8', 9', 10', 11', 12'

**Military demands for aluminum reduce supply, but Reynolds is rapidly expanding aluminum capacity. Rated orders receive priority handling.**

# REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

"The Kate Smith Evening Hour" on Television, Wednesdays—Tallulah Bankhead in "The Big Show" on Radio, Sundays—NBC NETWORKS

# McCarthy Drills
## CUT DRILLING COSTS!

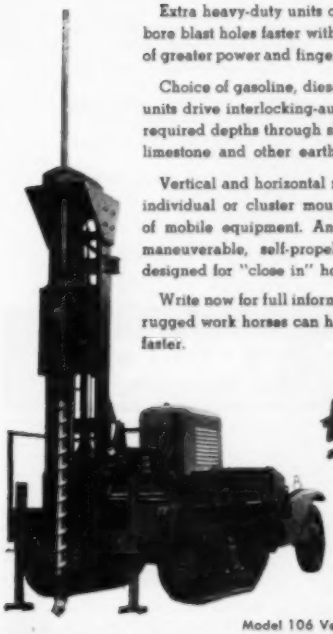
### BLAST HOLE DRILLS

Extra heavy-duty units compactly designed bore blast holes faster with less effort because of greater power and finger-tip hydraulic feed.

Choice of gasoline, diesel or electric power units drive interlocking-auger sections to any required depths through shale, sandrock, soft limestone and other earth formations.

Vertical and horizontal models are built for individual or cluster mountings on all types of mobile equipment. And there's a highly maneuverable, self-propelled unit specially designed for "close in" horizontal drilling.

Write now for full information on how these rugged work horses can help you hit pay dirt faster.



Model 106 Vertical Drill

*Heavy Rugged Powerful*

### COAL RECOVERY DRILLS

McCarthy Coal Drills bite into the seam's heart to pull out clean, valuable lump or slack coal with minimum effort, minimum cost.

Near Salineville, Ohio three men use one machine with 24-inch diameter augers to produce 90 tons of coal daily. At Germano, Ohio the same number of men use 36-inch diameter augers to produce 167 tons per day!

The rugged McCarthy Mineral Recovery Drills produce coal at $1.50 to $2.00 per ton, including amortization of investment cost. These hydraulically controlled units operate on gasoline, diesel or electric power.

Choose from 4 models. 4 to 24-ft. interlocking-auger sections are available in 20, 24, 30, 36, 42 and 48-inch diameters. Jacks are power operated.

McCarthy dealers can show you many testimonials of installations and help you make the most profitable selection for your specific need. Write today for full facts.

Weight 9700 Lbs. 36" Coal Recovery Drill

SALEM

MANUFACTURED BY

**THE SALEM TOOL CO.**

# It'll soon be 21!

**For 20 straight years** Internationals have been first in heavy-duty truck sales.

It will soon be 21. Another year will be added to International Trucks' heavy-duty leadership because truck operators who know hauling costs will *continue* to prefer the trucks that give them lower operating and maintenance costs, longer truck life.

If you are interested in these money-saving advantages, why not see your International Truck Dealer or Branch about the truck engineered for your job?

**INTERNATIONAL HARVESTER COMPANY · CHICAGO**

**Check these exclusive advantages of Internationals:**

- All-truck engines—exclusively for truck work—built in the world's largest truck engine plant.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab designed by drivers for drivers.
- Super-steering system—more positive control, easier handling and 37° turning angle.
- Traditional truck toughness that has kept International first in heavy-duty truck sales for 20 straight years.
- 115 basic models . . . everything from ½-ton pickups to 90,000 lb. GVW off-highway models.
- America's largest exclusive truck service organization.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

## INTERNATIONAL TRUCKS

*More than One Million Now on the Road*

Model LF-194, 145 inch wheelbase, 9x7 ft. dump body, 38,000 lbs. GVW.

# "Tycol Acylkup gets cars off fast... keeps them running under all weather extremes"

That's so right! Tycol Acylkup Mine Car Grease reduces low temperature drag . . . retards lubricant leakage at high temperatures . . . permits the handling of more cars per haul. It keeps cars running in top condition inside the mine and out.

Also, Tycol Acylkup's expertly blended calcium soap and specially selected cylinder oil stock combination assure long bearing life . . . less down-time loss . . . lower maintenance costs.

Ask your nearest Tide Water Associated office for complete information. Call or wire today.

**TYCOL**

**INDUSTRIAL LUBRICANTS**

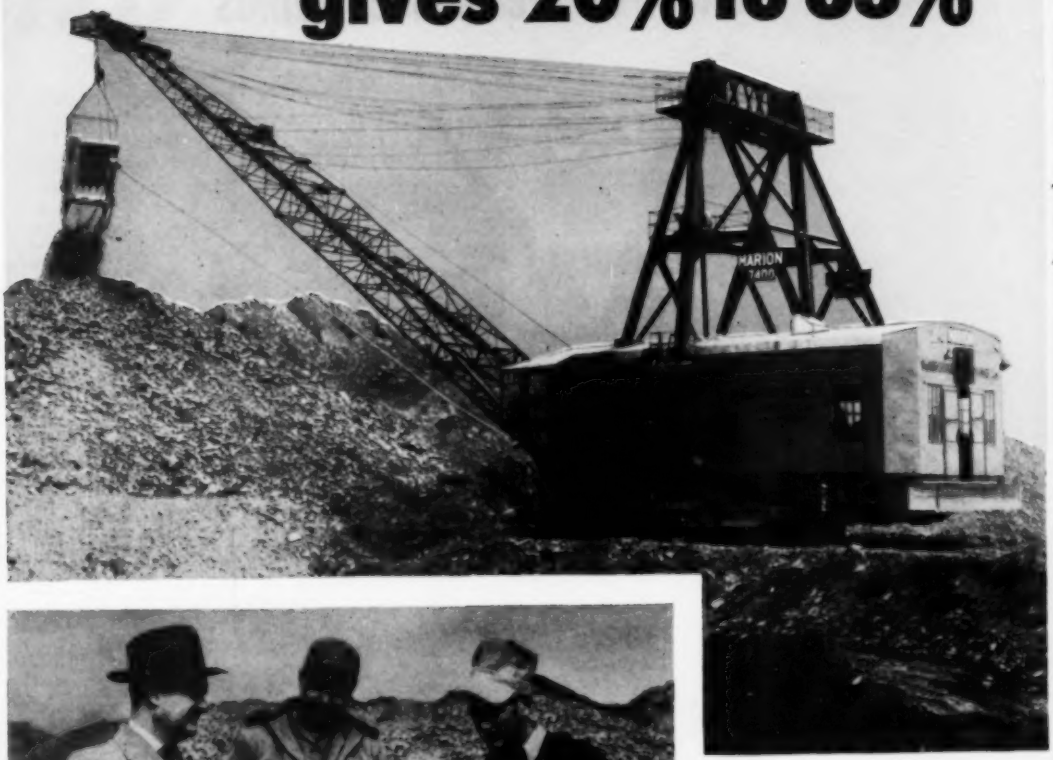
Boston • Charlotte, N. C. • Pittsburgh
Philadelphia • Chicago • Detroit
Tulsa • Cleveland • San Francisco

**TIDE WATER ASSOCIATED OIL COMPANY**

17 BATTERY PLACE - NEW YORK 4, N. Y.

**SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"**

# New American Tiger gives 20% to 83%

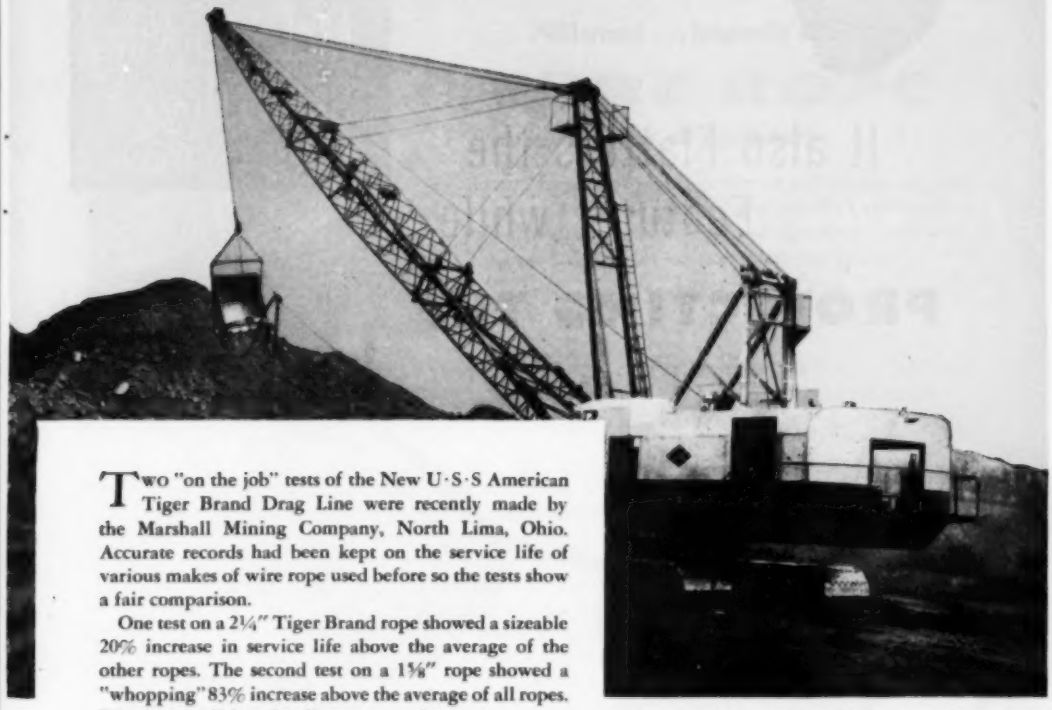



**20% INCREASE IN WIRE ROPE LIFE.** When this 14 cu. yd. drag line was equipped with the new Tiger Brand 2¼" Drag Line, the average service life of the rope was increased 20% over other brands tested.

**SAVES MONEY AND TIME—INCREASES PRODUCTION.** This new Tiger Brand Drag Line Rope quickly pays for itself through increased life and greater production. Try it next time you have to replace your drag rope.

USS AMERICAN TIGER BRAND WIRE ROPE UNITED STATES STEEL

# Brand Drag Line increase in service life



Two "on the job" tests of the New U·S·S American Tiger Brand Drag Line were recently made by the Marshall Mining Company, North Lima, Ohio. Accurate records had been kept on the service life of various makes of wire rope used before so the tests show a fair comparison.

One test on a 2¼" Tiger Brand rope showed a sizeable 20% increase in service life above the average of the other ropes. The second test on a 1⅛" rope showed a "whopping" 83% increase above the average of all ropes. Digging conditions in all cases were the same.

This new Tiger Brand Drag Line was designed especially to resist the severe operating conditions imposed by this class of service.

The use of this new rope on your drag line will mean substantial savings in your wire rope costs. It will cut your down time and help to keep machines at top capacity.

**DRAG LINE LIFE INCREASED FROM 600 HOURS TO 1100 HOURS**—83%. The best service on this drag line using 1⅛" rope averaged 600 hours for other brands of rope. But with the new U·S·S Tiger Brand Rope, service life jumped to 1100 hours—almost double the previous average.

## U·S·S AMERICAN TIGER BRAND WIRE ROPE

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

*Excellay Preformed*

UNITED STATES STEEL

NEW

Metal Ful-Vue Safety Goggle

## It also Flatters the Features while

# PROTECTING THE EYES!

You expect protection in a safety goggle and you certainly get it in the new, strongly constructed AO F4100 Safety Goggle with its 6 curve super armorplate lenses, new eyewire, rugged endpieces, double braced bridge and other quality features. But what's more, it's protection that workers are glad to wear because this goggle is good looking as well as functional. Your nearest "MSA" Representative can supply it—with or without side shields.

### QUICK FACTS

**(5 NEW CONSTRUCTION FEATURES)**

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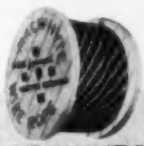

*Macwhyte Company, 2931 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.*

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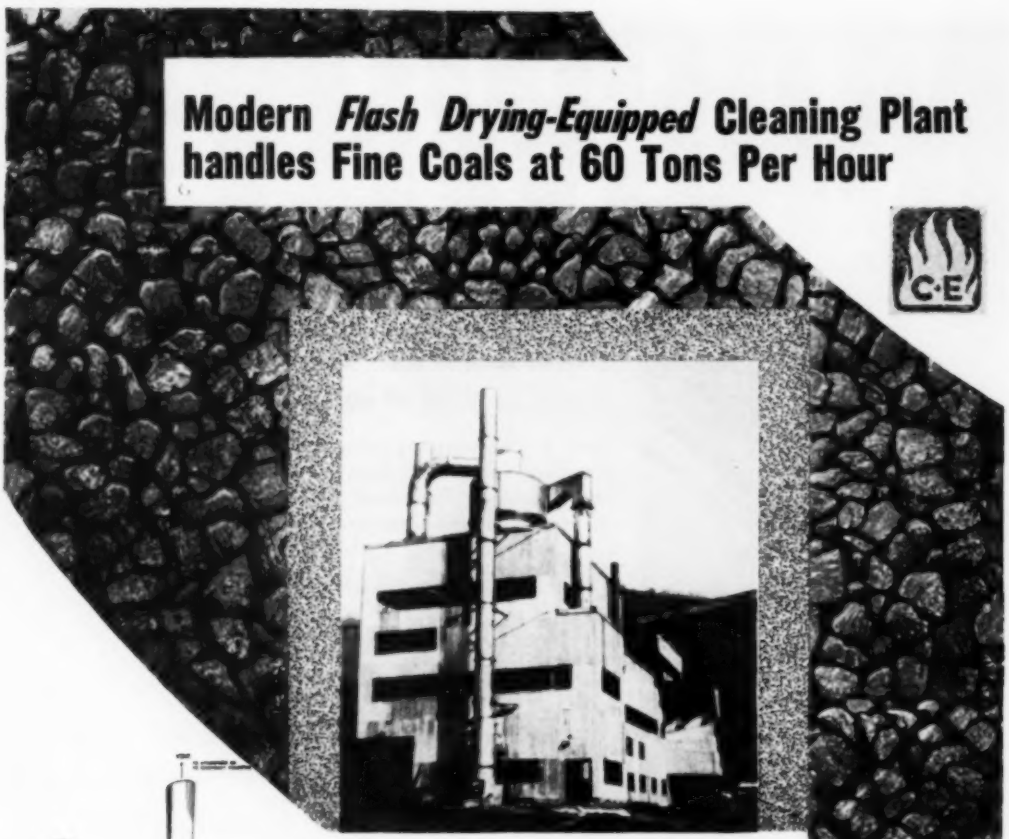

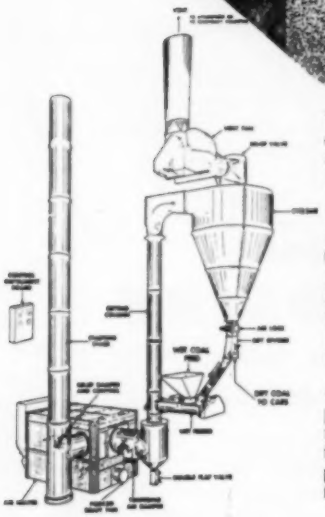

The successful operation of this Kentucky coal cleaning plant is typical of the high efficiency obtained in modern C-E Raymond installations for handling fine coals.

The Flash Drying System is set up with a single drying column, designed for a capacity of better than 60 tons per hour of finished product. Two grades of fine coal are produced . . . approximately 45 tons per hour of ¼ x 28 mesh coal with initial surface moisture of 7½% . . . and 15 tons per hour of 28 mesh coal x 0 with 25% moisture. Final moisture content is held to 2%.

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This 720 ton-per-hour Barge Unloader . . . designed, fabricated and erected by Heyl & Patterson . . . was recently put into operation for the Duquesne Slag Co., Pittsburgh, Pa.

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***All The Way from Design to Erection***

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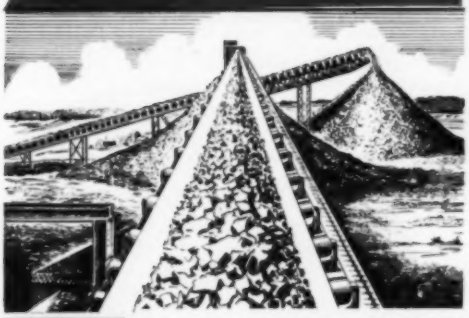
## RAY-MAN "F" CONVEYOR BELT



Users asked for a conveyor belt to stand up where there is exceptional tendency to tearing or puncturing . . . where pulleys are relatively small . . . and yet where only a thick, narrow belt could be used. It must hold fasteners better too. R/M engineers solved this combination of tough problems with Ray-Man "F", the new conveyor belt using unique properties of synthetic fibre strength members • Ray-Man "F" also gives you everything you ask for in a general purpose belt — troughability, flexibility, resilience for shock loading, better cover adhesion. It naturally follows that you get longer service than you ever thought possible in a conveyor belt • Bulletin 6915 describes it fully. Write for your copy . . . The R/M representative can show you equally good engineering in R/M hose, transmission and V-belts.

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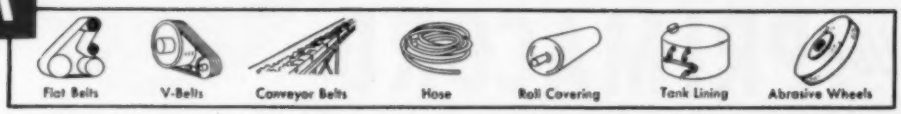


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There's a type for every job. **PLAIN PRIMACORD** for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion; **WIRE COUNTERED PRIMACORD** for deep, ragged holes; and **PLASTIC REINFORCED PRIMACORD** for deep, wet holes and river crossings.

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

APRIL, 1952

IVAN A. GIVEN, EDITOR

# Operation Pressure

HOW COAL MEN and union leadership will respond to the pressures in arriving at the next wage agreements can only be surmised at this writing. At the moment, it might be stated that these pressures are more on union leadership than on the operators.

The pressure that might lead Lewis to press for substantial additional concessions is the necessity for making a better showing than other union leaders. Steel therefore is the bellwether in 1952, and the consensus is that Lewis is constrained to wait for the steel settlement before making his move. And the steel situation has changed materially, even though there was still formal public agreement on the package. Behind the scenes, the situation is perhaps not so cut-and-dried. Steel demand has softened, so that even if price increases sufficient to cover increased costs were approved by the government, there is not the same assurance that the consumers would pay them. This leads to the conclusion that the wage package is not nearly the certainty that it was.

Then, in coal mining, there is the pressure of non-union tonnage, which represents a fifth or more of the bituminous output and has generated major activity to reduce it on the part of the union. Any further increase in wage rates and other benefits can only add to the pressure for such non-union production. Finally, there is price pressure, which bears first on the operators and, through them, on union leadership. Commercial coal is now in a less-favorable position to pass on cost increases, and it is logical, therefore, to maintain longer and more strongly that attempts to impose additional increases are likely to provoke long stoppages, abandonment of higher-cost operations and attempts to go non-union on a wider front than ever.

Once again, how union leadership and coal men will respond to these and other pressures can only be surmised. Lewis, for example, may choose to deny or ignore the possible consequences in loss of wages and membership, while enough operators to set the pattern may consider it possible to grant increases and not suffer too much of a penalty. But one thing cannot be ignored or denied, and that is that wisdom on both sides is essential if the opportunities of the future are to be fully realized.

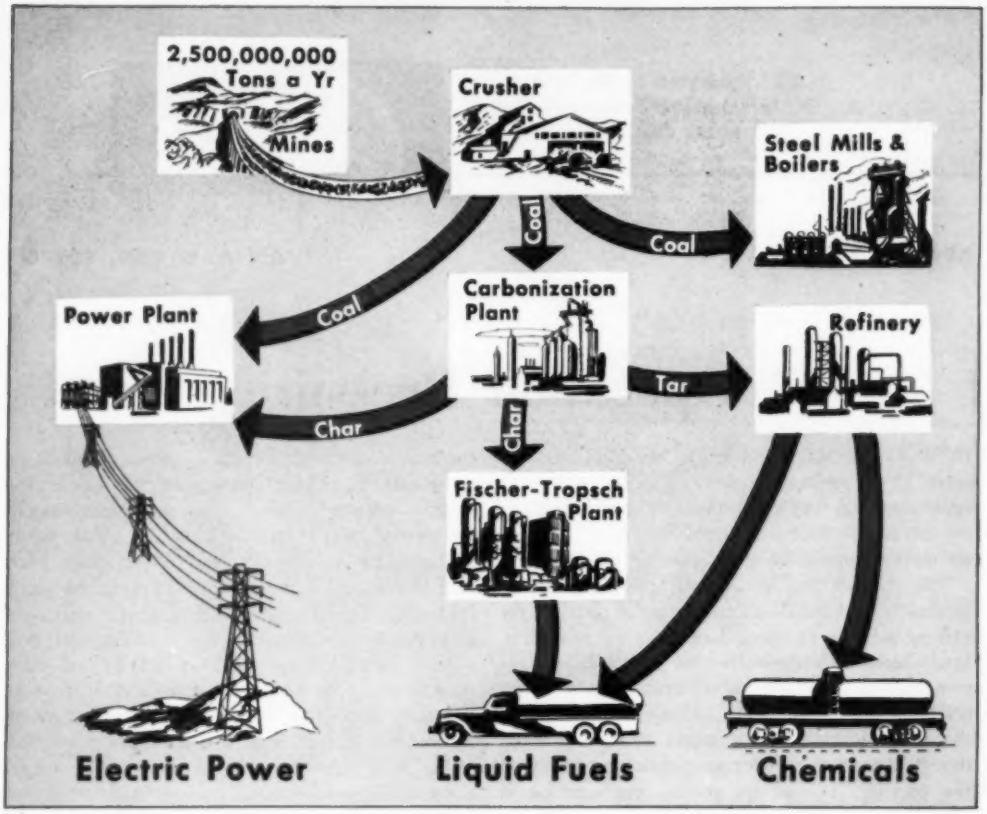
# Market Maker

RESEARCH looms up more each day as a major market maker. This is true for coal as well as for the many other industries with bigger and more-comprehensive programs. In fact, one criticism of the coal program is its smallness. In the bituminous industry, steps have been taken to remedy that defect—at least in part—by approval of the enlarged program of BCR. All that is needed is the money. The campaign to obtain it is on, and coal men should not miss the opportunity to build the markets the enlarged program will bring in its train.

# Real Know-How

THE 1952 COAL CONVENTION of the American Mining Congress, at Cincinnati, Ohio, May 5-7, again offers coal-mining men an outstanding opportunity to gain know-how in markets, production, preparation and safety. The need for such know-how is granted and the coal convention is set up to meet that need, not only in the formal program but in the opportunity to get together and swap notes. The table is being spread with the latest on procedure and practice, and all that is necessary is come and carry it away. It's a real opportunity.

**By the end of this century—2,500,000,000 tons of coal per year . . .**




# How the Coal Industry Will Look 50 Yr From Now

It seems that a plausible picture of the coal industry by the end of this century is as follows:

1. Coal will be mined at low cost with ingenious machines in terrific volume.

2. The coal then will be crushed.

3. The fine coal will be processed continuously in some sort of so-called low-temperature carbonization equipment, with or without an atmosphere of hydrogen.

4. The tar from the operation will be worked up to liquid fuels and a minor quantity of needed chemicals. The liquid fuels will be transported by pipe line to suitable points for retail distribution.

5. The char from the operation will be transported by pipe line to suitable points for the generation of electric power.

6. If the production of char is greater than the electric-power industry needs, a portion of it can be converted to liquid fuel by modification of Fischer-Tropsch process.

7. The quantity of coal handled in this way is likely to be at least five times present production.

This is not necessarily what *will* happen—but it *could* happen. The important thing for all of us to keep in mind is that what actually will happen is not to be determined by our desires or our hopes or our hard work.

The future will be determined by the needs of energy consumers, by the course of technologic developments and by the circumstances of our fuel reserves. And it will represent the welding of three great technologies—coal, petroleum and electric power.

We shall all move more rapidly if we swim with the economic and technological tide.

# Coal—Fuel of the Future

**Here's what an oil man sees for coal . . .**

**NOW:** As electricity, coal is regaining its place in home kitchens and basements.

**THE FUTURE:** As a raw fuel, coal will feed more steel mills and industrial boilers. In a gas turbine, it will drive locomotives when diesel-fuel costs rise. Changed to liquid fuel, it will fill in where oil falls short of national growth needs.

**FORECAST:** 2,500,000,000 tons by the century's end.

By EUGENE AYRES, Technical Asst. to the Exec. Vice Pres., Gulf Research & Development Co., Pittsburgh, Pa.

THE FUEL INDUSTRIES ARE THE BASE for the way of life to which we have become accustomed.

The greatest of these industries are coal and petroleum. They are alike in the fundamental respect that they provide fuel for comfort and for generating power for our industrial economy. But they differ in important respects and they are intricately intertwined.

We all are familiar with the fact that our coal reserves are immensely greater than our petroleum reserves. Although estimation of recoverable reserves is little more than educated guesswork, it is significant to observe that the maximum estimate of reserves of oil plus natural gas is only 10% of the *minimum* estimate for world reserves of coal. For the United States, the figure is 18%.

If we reverse the process and compare minimum estimates for oil plus gas with *maximum* estimates for coal, we arrive at less than 1% for either the world or the United States. The true picture, as it will develop in the future, probably will lie somewhere between the two extremes. In the United States, recoverable oil plus gas is likely to run about 3% of recoverable coal.

We have other fuels, of course. There is oil shale, for instance, which eventually may provide about 3% as much energy as coal. And we have some tar, which will provide scarcely a trace of energy, and peat, which someday may give about 1% of coal.

MR. AYRES: "Our future economy over the next two centuries is at the mercy of a sound coal industry."

But the conclusion is inescapable—and always has been inescapable—that our future economy over the next two centuries is at the mercy of a sound coal industry.

## HOW COAL AND OIL DIFFER

We are inclined to talk about the petroleum industry and the coal industry as though the word "industry" meant the same thing to each. It does not. And here's why:

A fuel industry may be made up of one or all of four different departments, as follows:

**1. The mining of coal or petroleum—the recovery from the earth of crude or run-of-mine material.**

Here the differences are sharp and clear. The removal from the earth of liquid or gas is a much simpler physical operation than the removal of solids. But for oil, we have the added task of discovery, which for coal is largely a matter of ancient records. The discovery of oil has been a profitable gamble, but a gamble none the less, and one which someday will become unprofitable.

**2. The conversion of the crude to marketable products.**

Here again the difference is marked. At present, considerable run-of-mine coal is sold for use without beneficiation. Almost no crude petroleum is used as such. The conversion of crude oil is essential to obtain the kind of liquid fuels required by the motorcar and other major petroleum markets. The refining of petroleum has its counterpart in the conversion of coal to electric power. People can do things with electric power that they cannot do with coal. Likewise, they can do things with motor fuel that they cannot do with crude petroleum.

But when a coal company manufactures power for sale, it is no longer regarded as a part of the coal industry. Instead, it suddenly becomes a part of the public-utility industry. Yet the operation is not fundamentally different from the conversion of oil to motor fuel for public retail sale. Later

**Table I—How Petroleum Is Moved In the United States**

| | Per Cent |
|---|---|
| In industry-owned equipment: | |
| Pipelines | 36 |
| Tank trucks | 28 |
| Marine tankers | 16 |
| Marine barges | 10 |
| In railroad-owned tank cars | 10 |
| Total | 100 |

From *Energy Sources: The Wealth of the World*, by Ayres and Scarlott.

**Table II—How Home-Heating Systems Rate Efficiency-Wise**

| Energy System | Efficiency Including Necessary Conversions |
|---|---|
| Electric with heat pump: | |
| Performance coefficient, 4 | 65 |
| Performance coefficient, 3 | 49 |
| Oil | 61 |
| Natural gas | 61 |
| Coal, domestic stoker | 60 |
| Enriched water gas | 46 |
| Coal, hand-fired | 42 |
| Electric (national average) | 16.3 |

on, of course, another major conversion for coal will be to motor fuel.

**3. The transportation of fuel to its points of use.**

Here we note an important difference. Nearly 90% of petroleum is transported in equipment owned and operated by the petroleum industry, as shown in Table I. This equipment includes pipe lines, marine tankers, marine barges and tank trucks. Only about 10% of petroleum is carried on railways. The control of transportation is essential to the petroleum industry and eventually will become essential to an integrated coal industry.

In contrast with oil, the great bulk of coal ton-miles involves equipment owned and operated by others, principally railways and ships. When a coal company moves its own coal for long distances, it is likely to be exiled into the railway industry.

Pipe-line transportation of coal appears to be in the offing. It will come, but it has been a long time on the way, the first experiments in pipe-line transportation of solids having been made in 1860.

**4. The distribution of energy to ultimate consumers.**

A lot of coal is distributed by the coal industry but about 22% is distributed in the form of electric power and gas by public utilities. Nearly all petroleum is distributed by the petroleum industry. A very little—less than 4%—is sold by public utilities in the form of electric power and manufactured gas.

In addition to their differences in these four departments, the oil and coal industries differ in the scope and integration of their operations. To be sure, all kinds of oil companies form the oil industry. A few are concerned only with recovery of fuel from the earth. A few purchase crude oil, which they refine and market. Some have no facilities for transportation and distribution. But the major oil companies are fully integrated and function in all four ways—recovery conversion, transportation and distribution.

On the contrary, coal companies rarely are integrated except by losing their primary status as coal companies. Some of them are so-called "captive" companies absorbed by public utilities, the steel industry or railroads. The coal industry still is largely a mining industry. Mining has not yet become incidental to manufacture, transportation of energy and distribution of final energy forms to ultimate consumers.

## NEW ENERGY FORMS WANTED

Trends of fuel consumption over the past few decades have been confusing. We have been going through —and still are going through—a transition period from which certain unmistakable trends are beginning to emerge. Our economy is strongly characterized by two developments:

**1. Increasing preference for electric power, which means coal, and . . .**

**2. Increasing preference for liquid and gaseous fuels for end uses, which means petroleum now and coal later on.**

The accelerated demand for electric power is almost sensational. Some recent studies show that the rate of demand for electric power is going up at least 1.6 times as fast as the rise in gross national product. The reasons for this phenomenon are so many and so varied that we cannot go into them here. But in spite of optimistic programs for building generating stations a power shortage now is with us and is likely to continue for some years. To double an industry every 10 yr is no mean task. Electric power demand now is going up even faster than that.

Our hydroelectric installations sometimes are described as vast, but terms like this are relative. The total energy now derived from water power is only about equivalent to the fuelwood we burn or to the quantity of anthracite produced—about 4% of our total energy requirements. New waterpower installations will be made, but the maximum practical increase will take care of only a minor part of expansion within the next few decades. So we find that the most rapidly increasing demand for energy is in the domain of coal.

## WHERE OIL SHALE FITS IN

During recent months careful studies have been made of costs of recovery of liquid fuel from oil shale and coal. On the basis of present technology it is much cheaper to make motor fuel from oil shale than from coal. For this reason, oil shale will be exploited first, but this development cannot be expected to postpone more than a few years the large-scale conversion of coal. These are the reasons why coal will move into the picture:

1. Low-cost oil shale is limited to thick deposits with horizontal cleavage from overburden, located on the sides of deep canyons for disposal of ash from retorts. Oil shale yields only about 10% oil—the rest is ash. On the average, it will be necessary to dispose of more than a ton of ash for every barrel of oil.

2. All low-cost oil shale is located in Colorado and Wyoming, where water is scarce.

3. The rate of increase in demand for liquid fuel can be taken care of by supplemental oil-shale operations for only a few years.

4. Since technologists know that our ultimate dependence must be on coal, extraordinary efforts will be made to lower the cost of coal conversion.

## HOW COAL WILL BE USED

So the picture for the long term is that the downward trend of coal's proportionate share of our energy demand will be sharply reversed. While the demand for liquid fuel probably will continue upward for a long time, more and more of the liquid will come from coal. In the meantime, coal will be required to an increasing extent for electric power. On the other hand, the use of coal as such will go downward for nearly all applications except conversion to electric power, to metallurgical coke or to liquid, and for generation of steam in large boilers. In this respect, coal may become like crude petroleum, less than 2% of which is used as such.

There are many good reasons for expecting this sort of industrial demand. Competition between industries is a curious thing. We often try to accomplish an illogical task when that happens to be our business. But it always is a losing battle. For example, in Washington, D.C., where strong competition exists between the oil and natural-gas industries, both industries want the home-heating business. But gas will win out in the end, if it is in sufficient supply and if prices of the two are comparable, because gas is nicer to use.

In some other cities, gas and electric power are competing for kitchen ranges. Given costs not too far apart, electric power will win out because it is nicer to use. In 1950 the ratio of gas ranges to electric ranges sold narrowed to about 3:2, against a ratio of 16:1 in 1935. The ratio of gas to electric ranges in service has declined from 20:1 in 1935 to 4:1 in 1950. Thus, in transmuted form, coal is moving back into the kitchen.

Electric power has not yet come into its own for home heating but the handwriting is on the wall. Thousands of new homes with electric heating now are under construction. With heat-pump installations, electric power already is beginning to displace gas, as gas is displacing oil and oil is displacing coal. The reason is clear. Electric power is nicer to use. Coal is in the way of completing a full cycle.

## NEW LIGHT ON DIESELS

The displacement of the steam locomotive by the diesel-electric now is a familiar story. But the story is not yet fully told. When oil finally is obtained from coal, the diesel-electric may be displaced by some efficient coal-burning device, since the over-all efficiency of coal conversion plus diesel-electric conversion would be much lower than that of a gas turbine, for instance.

Diesel-electric developments have made conflicting impacts on coal economy. In 1948 transportation of coal was about 200,000,000,000 ton-miles. The coal required for this transportation would have been about 33,000,000 tons if the whole job had been done by coal-burning steam locomotives. But the coal equivalent of the oil required, if the job had been done altogether by diesel-electric locomotives, would have been about 13,500,000 tons—little more than one-third as much.

Thus the market for coal is contracted by the substitution of oil. Yet, since it costs less to move coal by diesel-electric locomotive, the expansion of the coal market in other directions *should be* far greater than the contraction attributable to diesel inroads. Nearly half the cost of coal on the Atlantic Coast is for transportation. It happens that freight rates are going up, but it may be presumed that the rise would have been more rapid if the diesel had not moved in. Here, then, is an instance where the sale of oil may accelerate the sale of coal.

Another somewhat similar story is the development of steam-turbine oils that last 20 times as long in service as former oils. These oils have contributed to the low cost of electric power, which means more sales of electric power and a bigger utility market for coal.

Gasoline or diesel fuel in an amount equivalent to 500,000 tons of coal per year is required to deliver about 100,000,000 tons of coal by motor truck to points of ultimate retail use. A cheaper or more convenient way to deliver coal would be difficult to find. It happens that approximately the same amount of coal—500,000 tons—is required to generate the electric power used for the production of oil and gas.

## ENERGY LOSS—COAL AND OIL

Energy always is required to convert fuels from one form to another. The thermal efficiency of modern oil refineries averages about 87%. In other words, 13% of the crude, or an equivalent amount of energy from other sources, is required to operate the refinery. Some refineries therefore burn coal to conserve oil. This practice is likely to grow. On the coal side, losses somewhat greater than 13% occur in making a finished product from run-of-mine coal.

The thermal efficiency of conversion of coal to electric power now averages about 21%. Large modern plants, of course, do much better. Though this figure seems low, electric power is utilized with high efficiency for heating as well as for power.

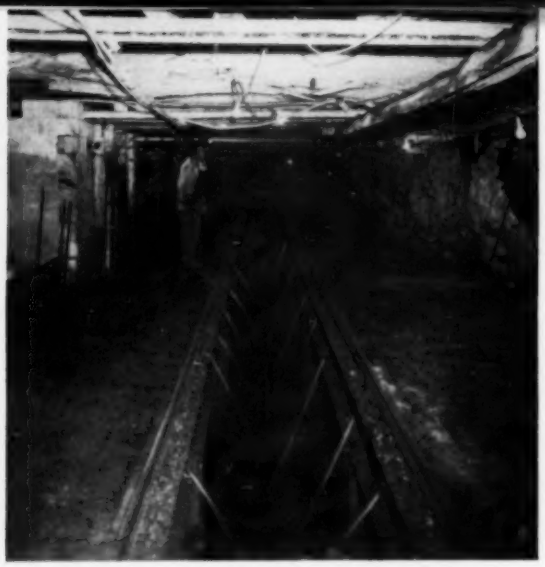
Meanwhile, with efficiencies of power plants going up and destined to rise still further, the thermal efficiencies of oil refineries have been going down—and must continue to go down—because of the growing complexity of liquid-fuel preparation. When the time comes for conversion of coal to motor fuel, efficiencies are likely to run about 75% instead of the present 87%. This figure seems high compared with the best electric-power generation. But if we balance the conversion inefficiency and the utilization efficiency of the coal-electric power system against the conversion efficiency and utilization inefficiency of the liquid-fuel system, we see that the two energy systems are pretty much on a par.

## EFFICIENCY—BIG MARKET FACTOR

The excellent work of electric-power engineers in improving efficiencies of power-generating plants means, of course, less coal per kilowatt-hour, but it also means more coal per annum or per capita because people use more electric power when it is cheap. A somewhat similar paradox is found in the development of more efficient sources of light. The Welsbach mantle, for example, tripled the light output of gas burners but instead of cutting consumption of fuel to one-third, the invention increased the demand for fuel manyfold by providing more adequate light. This has happened with every subsequent improvement in light generation.

Likewise, the reason that demand for motor fuel has gone up so steadily and so rapidly is that the oil industry has found ways of keeping the cost of motor fuel (*ex taxes*) from rising for the past 25 yr. This achievement has been notable because the quality of motor fuel has been radically improved over the period.

One reason for the usefulness of oil and gas is that they can be transported easily in pipe lines for thousands of miles. Electric power is limited in this respect. Engineers see little prospect of increasing the distance for transmission of electric power beyond the present 300 to 500 mi. For large blocks of power, the limits are even lower. The problems are largely economic. And yet much of our coal is far from centers of consumption. For this reason, commercial experiments now under way for pipe line transportation of crushed coal are of fundamental importance. Such transportation would move coal cheaply to electric-power plants, which would convert it to power for nearby customers.



**SMOOTH HAULAGE** **EFFICIENT TRANSPORTATION** starts at the room faces with conventional loading machines discharging to shuttle cars (left) and includes a 275-ton hopper at slope bottom (right) which receives coal from 6-ton drop-bottom mine cars. Panel belts from opposing room entries fed by shuttle cars discharge to a single hopper on main entry for loading mine cars. Main slope belt, 1,500 ft long, feeds tipple.

# Efficient Machine Mining

**Shuttle cars, panel belts and 6-ton mine cars efficiently transport coal from working sections to main slope belt at Peabody's new Mine No. 40 in the Illinois No. 5 seam. Roof bolting increases recovery and safety.**

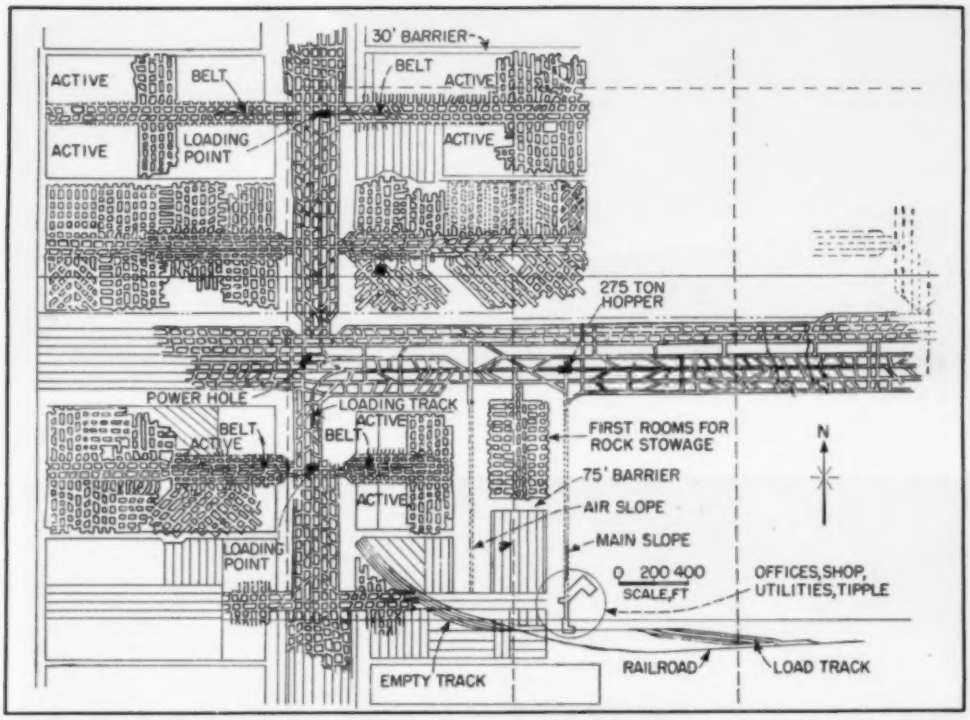
**GOOD ROOF-BOLTING** **SYSTEMATIC BOLTING** in cycle and close up to face, combined with foresighted planning, efficient application of machines and a smooth buggy - belt - mine car haulage system results in high productivity from the 4-ft-thick Illinois No. 5 seam at Peabody Coal's Mine No. 40.

"FOUR SQUARE WITH THE WORLD" is new Mine No. 40 of the Peabody Coal Co., Galatia, Ill., where employees using conventional mining machines produce about 4,400 tpd from the Illinois No. 5 seam in Saline and Williamson Counties. The four-square designation, applied to No. 40 by officials at the mine, is a reflection of the controlled layout of the property; the main slope and air slope dip due north and underground openings are driven on the cardinal points of the compass.

Features of the new mine are (1) combined shuttle-car, mine-car and belt haulage, (2) opposed room panels which permit one loading point in the main entry to serve two panel belts, (3) roof-bolting methods for controlling roof that shears along rib lines and develops slips in other directions and (4) foresighted planning as typified by the early rooms that were driven to provide spoil room for the rock that had to be lifted to increase haulage-entry height, and to provide some tonnage during development.

No. 40, one of the latest of five new Peabody mines opened since 1947, further insures the company's position as one of the nation's largest commercial miners and marketers of bituminous coal. Guiding this steady

**Peabody No. 40—Engineered for high output with maximum safety . . .**




**FOUR-SQUARE PEABODY NO. 40,** a new modern mine, features high productivity as workers mine about 4,400 tons per day. Room-and-pillar system features opposed room entries for simplified haulage, blind rooms between sets of five rooms to provide better roof support and 21-ft-wide passing places in haulage entries made possible by using both steel crossbars and roof bolts. The slope was opened in September, 1949.

# Operating Highlights at Peabody Mine No. 40

### Mining Conditions

Seam, No. 5 averaging 48 in of clean coal. Bottom, stable and suitable for shuttle cars. Roof, varying at different places, with troublesome roof a gray shale with vertical planes of weakness. Before bolting, 2 to 6 in of draw rock tended to fall soon after exposure.

### Roof Control

Systematic roof-bolting in cycle, with 75 to 125 bolts installed per crew shift, using 1-in wedge-type bolts 30 in long on 4-ft centers in both directions with rib bolts angled out over pillars. Dry drilling with dust collectors.

### Mining Method

Room-and-pillar, with six, seven- or eight-heading main entries driven on cardinal points of compass. Triple-heading room entries, 14-ft wide on 80-ft centers with crosscuts 80 ft apart driven from mains 485 ft long to open 27 or 28 rooms on each side. Rooms, 26 ft wide on 50-ft centers, varying in length but most commonly 250 or 300 ft. Room crosscuts, 16-ft wide on 50-ft centers. Advancing, room entries driven to limit, with rooms necked 50 ft. Retreating, rooms worked in sets of five on both sides back to mains. Barrier pillars, 100 ft wide along entries, 30 ft wide between room sections.

### Face Preparation

Coal undercut; drilled with 6-hole round for Airdox breaking; cuts, 8 ft deep.

### Haulage

Shuttle cars discharge to 30-in Goodman panel belt in center heading of room entry; panel belts from opposing room entries feed to single hopper at main-entry loading point for loading 6-ton ACF drop-bottom cars hauling to 275-ton hopper at slope bottom, from which 42-in 1,500-ft Goodyear slope belt fed through shuttle belt discharges to railroad-car loading tipple on surface.

### Section Output and Equipment

Currently, seven mechanical sections averaging 320 tons per shift, with highs of 500 tons; two-shift basis. Basic section equipment: Joy 14-BU loader; either Sullivan 11-RU or Goodman 512 cutting machine; two Joy 5-SC shuttle cars; rubber-tired drilling unit equipped with two Dooley 580 drills; and Sullivan pancake-type air compressor mounted on Joy T-1 truck providing air for LeRoi stopers drilling roof-bolt holes and also powering Chicago Pneumatic impact wrench.

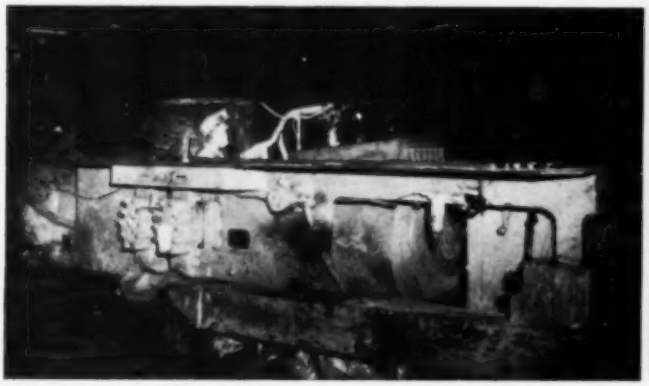
### Power

Power for haulage and face equipment at 275-v DC provided by two 300-kw m-g sets fed by a 2,300-v AC borehole cable which enters near the center of the mine.

## Peabody No. 40—Engineered for high output with maximum safety . . .

**30-IN PANEL BELT,** fed by shuttle cars, handles coal from 10 rooms, five on each side of the room entry, and discharges to a hopper at the main-entry loading point.

**J. W. WILLIAMSON,** mine superintendent, supervised operations at No. 40 when this article was prepared.



**PANCAKE-TYPE COMPRESSOR** powers roof stoper and impact wrench and also includes a receiver and filter for dry-dust collector. Compressed-air coal breaking (right) increases safety and permits on-shift face preparation.

growth are Stuyvesant Peabody Jr., president, and Frank White, vice president in charge of operations, located at Chicago. S. L. Anderson, division superintendent, is in charge of the Southern Illinois division office, at Marion, Ill., assisted by C. E. Bratten, division engineer. John W. Williamson, mine superintendent, No. 40, is assisted by J. E. Wagner and F. Rice, mine managers, and L. Cobb, chief electrician.

### ROOM-AND-PILLAR SYSTEM

As shown in the accompanying map, the property is subdivided by east-west and north-south main entries having six, seven or eight headings. Triple-heading room entries are driven from the mains to a distance of 485 ft to open 27 or 28 rooms on each side. Room lengths vary, the most common lengths being 250 and 300 ft.

Entries are 14 ft wide, except where haulage openings have been widened to 21 ft to permit a double track for passing. Rooms are 26 ft wide on 50-ft centers and room crosscuts 16 ft wide on 50-ft centers. Entries are on 50-ft centers with crosscuts 80 ft apart. All turns in the room sections are at right angles to insure that each face cycle produces a full cut of coal.

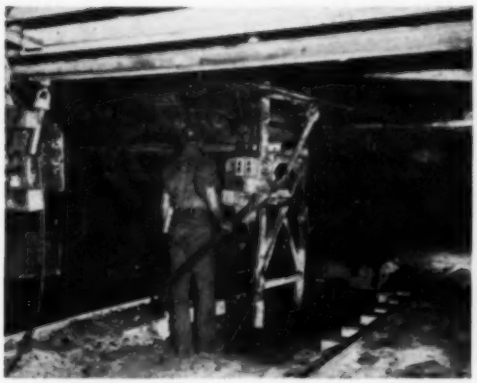
The sections marked "active" on the map show the working locations of the seven machine-mining units in service at the time the mine was visited. Pillars are left because roof conditions will not permit their safe removal.

The set of rooms between the main slope and air slope, which, incidentally, straddle the Williamson-Saline county line, were driven in the early development period to provide some early coal and to make room for the rock to be taken up later in the haulage openings. This method of disposal made it unnecessary to take the rock to the surface where disposal would have interfered with surface development.

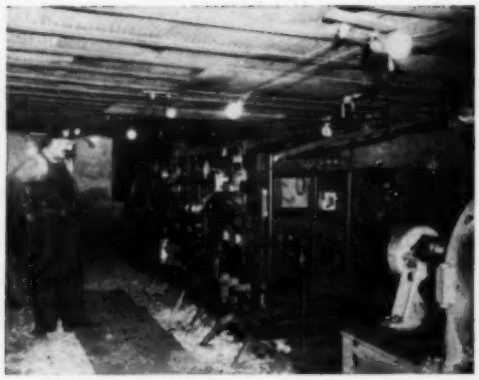
### COMBINED TRANSPORTATION

In the working sections, coal is hauled in shuttle cars from the rooms to the center heading of the room entry and discharged to a panel belt, which was installed as the entry advanced. The panel belts from opposing room entries discharge into a single hopper at the loading point in the main entry to feed the 6-ton drop-bottom cars used in the mine. The loading-point attendant operates a swing gate in the hopper to prevent spillage between cars and controls a car hoist for moving the trip. Double track at the loading point permits empty cars to be added to the trip without interfering with loading.

The drop-bottom cars are hauled to the foot of the slope in 10-car trips,



**LOADING-POINT HOPPER** in main entry receives coal from two opposing room panels for loading cars.



**TWO 300-KW M-G SETS,** fed by 2,300-v AC borehole cable, provide 275-v DC power for haulage and face equipment.

where they discharge into a 275-ton hopper equipped with mist sprays to allay dust.

The hopper feeds the 42-in main slope belt through a shuttle belt, and the 1,500-ft-long slope belt discharges to a railroad-car loading tipple on the surface. The coal is prepared in the preparation plant at the company's No. 47 mine at Harco, Ill.

Coal production is on a two-shift basis. On the third shift, supplies are distributed, panel belts are extended or shortened and maintenance duties are performed.

## FACE EQUIPMENT

Production per unit shift averages about 320 tons, but there are instances of 500-ton unit shifts at No. 40.

Basic equipment in each section includes a Joy 14BU loading machine, a Sullivan 11RU or Goodman 512 cutting machine (four 11RU's and three 512's), a rubber-tired drilling unit equipped with two Dooley 580 drills, and two Joy 5SC shuttle cars.

Also, each section is equipped with a Sullivan pancake-type air compressor mounted on a Joy T-1 truck to provide air for the LeRoi stopers used in drilling roof-bolt holes. A Chicago Pneumatic impact wrench also is powered by the compressor.

In face preparation, the coal is undercut, then drilled with a 6-hole round in rooms and broken up for loading by Airdox equipment which supplies a pressure of about 8,500 lb per sq in at the face.

## ROOF BOLTING

The bolting crew in each section follows the loading machine, so that as soon as the working place is cleaned up, bolts may be installed right up to the face. Throughout most of the mine, from 2 to 6 in of draw rock showed a tendency to fall soon after exposure until roof bolting was adopted. Bolting appears to have eliminated the problem to a great extent.

The roof-support plan at Mine No. 40 requires that bolts be installed on 4-ft centers in both directions, with rib bolts angled out over the pillar. This systematic bolting, close to the face and soon after the roof is exposed, permits coal to be mined that otherwise might be unminable.

The bolting crews are keeping up with the cycle by installing from 75 to 125 bolts per shift, depending on the number of cuts.

Drilling is done dry, and to protect the driller from harmful dusts the bolting machine carries a dust collector. Dust from the hole is collected at the collar and carried back through a flexible tube to a filter on the compressor.

The bolting crew works under safety jacks left in the place by the loading crew. Cuts are 8 ft deep, requiring two rows of bolts to furnish protection right up to the face.

★ ★ ★ ★ ★

## *The Girdle Can Bite Back Too!*

**FREAK ACCIDENTS of the year listed by the National Safety Council include a broken wrist for a corset saleslady as a result of trying to put a girdle on a hefty customer. If safety rules were written for girdle saleladies, it's amazing how nearly the same rules would apply to other operations, including coal mining. As W. L. Dow, editor, Rex Reporter, as recounted in C F & I Blast, points out, here are some of the safety rules that might apply to corset salesladies:**

**Size up the job first. If it's too big for you, call for help.**

**In team efforts, only one person should call the signals.**

**Bend knees, put strain on leg muscles instead of your back.**

**Guard against strains and sprains. Gradual heaves are better than sudden, sharp jerks in the installation process.**

**Beware of pinch points. See that your hands are in the clear before signalling for a hoist. Use the right tools for the job. Shoehorns won't work. Besides, they're ticklish. Safety codes rule out chisels and mallets.**

**Stepladders help a lot with a tall job. Can openers are permissible only in an emergency.**

**Like the girdle which makes molehills out of mountains, safety has a beneficial two-way stretch:**

**1. It stops reckless motions, holds in dangerous excesses, gives a firm foundation for daily actions.**

**2. It slenderizes you, reduces waist, and shows you have absolutely no stomach for risky behavior.**

★ ★ ★ ★ ★

# "A Letter to the Editor"

**On Jan. 13, the New York Sunday *Times* published an article entitled "Life–and Death–in Coaltown," by John Bartlow Martin. This article, keyed to the gloom that followed the disaster at West Frankfort, Ill., created a total impression of the coal industry and its people that is neither fair nor in accord with the present facts.**

**When a misleading article like Mr. Martin's appears in a respected newspaper like the *Times*, what should *Coal Age* do? Our editors think *Coal Age* should take up the challenge. That's why an associate editor of our magazine wrote a letter to the editor of the Sunday *Times*. Here is the letter:**

EDITOR, THE NEW YORK SUNDAY *TIMES*

May I offer some facts and comments about the coal industry in amplification of Mr. Martin's article, "Life–and Death–in Coaltown," published in your issue of January 13?

The coal industry, vital to our industrial and military might, deserves to be well and truly known for what it is: a rugged, progressive industry conscientiously discharging its obligations to the Nation, to the communities where its mines are, and to its workers and their families.

Granted, coal took a late start toward social consciousness. Granted further, there still are laggards in the industry. Today's leaders in coal are the first to admit these facts and they see a long way yet to go, even for their front ranks.

But while there is no argument about Mr. Martin's main thesis–that coal mining must be made safer–his broad brush blanks out the industry's advances in safety and miner welfare and paints the entire industry in dismal colors that rightly belong only to the laggard few. Coal has moved forward faster and further than the casual Sunday reader would gather from Mr. Martin's article. He has achieved a dramatic story by generalizing from particulars, but the total effect is misleading and unfair.

May we take a second look at some of Mr. Martin's figures?

**Fatal and Non-Fatal Injuries in Coal Mines**

| BITUMINOUS | 1930 | 1940 | 1950 |
|---|---|---|---|
| **Fatalities:** | | | |
| Number | 1,619 | 1,204 | 550 |
| Rate per million tons | 3.46 | 2.61 | 1.07 |
| Rate per million manhours | 2.16 | 1.92 | 0.93 |
| **Non-fatal injuries:** | | | |
| Number | 71,217 | 43,944 | 28,380 |
| Rate per million tons | 152.33 | 95.37 | 54.97 |
| Rate per million manhours | 94.94 | 70.28 | 47.83 |
| **ANTHRACITE** | | | |
| **Fatalities:** | | | |
| Number | 444 | 184 | 92 |
| Rate per million tons | 6.40 | 3.57 | 2.09 |
| Rate per million manhours | 1.76 | 1.50 | 0.75 |
| **Non-fatal injuries:** | | | |
| Number | 28,764 | 13,782 | 8,855 |
| Rate per million tons | 414.56 | 267.67 | 200.90 |
| Rate per million manhours | 113.90 | 112.56 | 71.72 |

**1. He says that between 1910 and 1949, 72,980 coal miners were killed at work–an average of 1,825 a year–and that over 50,000 have been hurt every year.**

Correct, as far as he goes. But the downward trend in accidents since 1930 shows substantial progress. The table at lower left, from records of the U. S. Bureau of Mines, measures the advance:

**"In recent years," Mr. Martin goes on, "something more than 1,000 men have been killed every year."**

In the three years 1949-51, which are recent years, deaths in coal mines have ranged from 790 down to 593 and have averaged 675. That is 675 too many, but it is not 1,000.

Coal's rightful claim to progress in safety in no way minimizes the fact that pain and death are grim and solemn. They are grim and solemn in a coal mine or elsewhere. But the industry's improving record is no mean achievement in the face of such inherent hazards as Mr. Martin cites.

**2. "A novice could not survive a day in a coal mine. . . . Electric locomotives crush men. Fast, modern mining machinery maims men."**

There now are 440,000 miners on company payrolls, well over one-fourth of them under 30 years of age. All of them, at one time, were novices. There is leaky logic somewhere in Mr. Martin's first sentence.

He would have us believe that modern machine mining is as dangerous as outmoded hand mining, if not more dangerous. The facts do not bear this out. While the safety record has improved, bigger, better and faster machines have been placed in the mines in increasing numbers. In 1930, for instance, only 10.5% of underground bituminous production was loaded by machine; in 1950, 69.4%.

**3. "The miners descend to the bottom of the shaft, perhaps 500 ft down into the earth."**

The average depth of underground coal mines in the United States is about 190 ft. Shaft mines add up to only 16% of total underground mines and produce only 28% of the underground tonnage. Mr. Martin's miner belongs in the minority.

**4. In many places coal beds are only 3 or 4 ft thick, Mr. Martin writes. He paints a picture of "terrible toil."**

His picture is true for some specific thin-seam mines where mechanical cutting and loading devices are not installed. But as a blanket description of thin-seam mining, it is not a true picture. There are plenty of machines designed for "low coal" now at work in 30-in seams. They take the curse off thin-seam mining.

In fact, a thin-seam mine is the exception, not the rule. In Illinois, where the explosion occurred that inspired Mr. Martin's article, seams average over 6 ft and most of the coal mined comes from seams 5 to 7 ft thick. In Ohio, over 70% of the coal mined comes from 4- to 6-ft seams. In the Appalachian fields, seams average 5 ft, with only 15 to 35% of the coal mined in the several states coming from seams under 4 ft. East of the Mississippi, coal beds average 5½ ft; in Wyoming, 13 ft; in Montana, 17 ft.

**5. "The miner is his own boss. He has no foreman at his elbow."**

Even in the anthracite field, where he held on longest, the contract miner, working alone or with his helper in a small section, is fast vanishing. In bituminous mines, he is virtually non-existent. Mine managers have found that miners produce more coal and have fewer accidents if they are closely supervised. In a well-run mechanized mine today, there is a foreman for every crew of 6 to 16 men.

**6. "Young men with education are just not going underground." Mr. Martin quotes Mr. Lewis' claim that in 1947 the average age of miners was 51.**

Compulsory school-attendance laws guarantee some education for almost everybody—even children who live in mining towns. In several states, special mining courses are taught in mining-town high schools. In addition to the usual courses in English and social sciences, the curriculum includes elementary geology, electricity, mechanics, engineering mathematics and safety. An Ohio coal company reports that 14 graduates from such courses now are working in mines near by. If this seems a small number, it is because the draft has snapped up other graduates.

On the college level, a recent canvass shows that 257 men were graduated in 1951 from mining-engineering schools in 10 colleges and universities. Of these, 177 now are working underground. The remaining 80 are working at surface mines, in preparation plants or with mining-equipment manufacturers, or have been drafted.

As for the age of coal miners, the Social Security Administration reports that in 1947 the median age of bituminous miners was 38.7 and that in 1948, 53.5% were 39 or younger and 64.6% were 44 or younger. The difference between the ages of coal miners and other American industrial workers is not great. State laws forbidding the employment of youngsters under 18 in underground coal mines accounts for part of that difference.

**7. "In 1949 the average full-time coal miner earned $2,922 (before payroll deductions, which may come to $500). . . . Often miners work as little as 120 days per year."**

For 1949, the National Industrial Conference Board's *Economic Almanac* records earnings of $2,925 in bituminous, $2,896 in anthracite; for 1950, $3,268 and $3,107 respectively. Mr. Martin overlooks the union-ordered three-day week that stretched through much of 1949 and, punctuated with full-scale shutdowns, reached into 1950. Naturally, the miners' self-imposed short work schedule whittled down their earnings. Even so, in 1949 and 1950 they worked considerably more than 120 days—in 1949, 157 for bituminous and 195 for anthracite; in 1950, 183 and 211 respectively. He also passes over the fact that in 1949, even working part time, the bituminous miner

## What Mr. Martin Says About "A Letter to the Editor"

EDITOR, NEW YORK SUNDAY *TIMES*

I have your note of Feb. 8 . . .

I don't know what kind of comment you want on this. Mr. Stanbury's letter runs to some 3,500 words which is longer than my article. To answer him point by point would require another long manuscript, which would no doubt provoke another outburst from him.

The sources I used for my statistics in my recent piece in The *Times* were, in the main, the U. S. Bureau of Mines' *Minerals Year Book* for 1949; the *Statistical Abstract of the United States* for 1950; *A Medical Survey of the Bituminous Coal Industry* (Report of the Coal Mines Administration, 1947) and the Senate hearings into the causes of the Centralia mine disaster.

Notoriously, statistics can be used and can be interpreted in many ways. For example, Mr. Stanbury in his Point 1 complains of my statement that "in recent years something more than 1,000 men have been killed every year." He cites statistics which he says show that between 1949 and 1951 this is not so. All right, but the *Minerals Year Book* shows that in 1945, 1,068 men were killed in coal mines; in 1946, 968; in 1947, 1,158; and in 1948, 999. Those are recent years, too.

Many of his complaints are based on an assumption that my article purports to be a description of a "typical" mine or miner or mining town. It does no such thing and in fact the article specifically states that "miners' living conditions vary widely in different parts of the country." Obviously there is no such thing as a typical coal miner.

As to the non-statistical parts of the story, they were simply based on my own knowledge and I am sure of my facts—that union bosses and coal operators do make deals to the detriment of the miners, that on some mornings the sky is gray in coal camps, that carelessness in a coal mine means death, and that the widow of a miner who was killed in the Centralia mine disaster did look to me as I said she did when she opened the door.

Furthermore you can tell Mr. Stanbury if you want to, for me, that if he and the coal operators would expend as much energy in trying to make the mines safe as they do in attacking critics, they would have far fewer critics.

Yours very truly,

(signed) John Bartlow Martin

60 Sunset Road, Highland Park, Ill.

earned more than the average worker in highway transportation (passenger), the telephone and telegraph industries, medical and other health services, legal services, tobacco, textiles, and lumber and timber. In 1950, he held his lead on these workers and moved ahead of employees in food plants and miscellaneous manufacturing industries.

If as much as $500 was withheld from his pay, it was for federal income taxes, social security, union dues and assessments, and medical and hospital care for himself and his family. Payroll deductions don't make the miner unique.

Records of the U. S. Bureau of Mines show no year since 1890 in which bituminous miners averaged as few as 120 days of work. The low years were 1922, with 142 days, and 1932, with 146 days. In the decade 1931-40, bituminous miners averaged 176.4 working days, anthracite 184.2; in the decade 1941-50, 225.8 and 247.4 respectively; in the five-year postwar period 1946-50, 198.6 and 240 days. Maximum working days per year for a five-day week, less the miners' two-week paid vacation and some seven or eight contract holidays, add up to a little over 240.

**8.** **The miner "never has any money ahead."**

Who does, these days?

But they buy TV sets. In a Kentucky mining town, for example, the company has erected an antenna on top of a nearby mountain and the miners have hooked their TV sets to a company-built coaxial cable that brings the broadcasts down into the valley. That town is not unique in that its citizens own TV sets, electric refrigerators and cars.

**9.** **Mr. Martin's miner doesn't own a car and doesn't think any other miner can afford one.**

But look at the picture at the start of Mr. Martin's story. Do all those cars parked at the tipple belong to mine officials, equipment salesmen and casual visitors? The truth is that a growing number of miners live far from the mine and drive 5 to 20 mi between their homes and the mine.

**10.** **Some miners "own their neat white cottages in a pleasant farm town." But Mr. Martin gives them short shrift. His eye is on those who "dwell with their pigs and children in a tumbledown hovel in a coal-company town."**

That there are miners who still live in hovels is a tragic fact, and the industry must carry the onus as long as those conditions exist anywhere.

But the net effect of Mr. Martin's description is out of line with the overall facts. The National Coal Association estimates that 8 out of 10 bituminous miners either own their homes or rent from private landlords. In recent years, some 23,000 company-owned houses have been sold to workers or private real-estate firms. Except in isolated regions where no other housing is available, the company town is vanishing. Even in those regions, mostly in the Appalachians, more and more company towns are showing neat and attractive homes, recreation centers, parks, playgrounds, swimming pools and good streets. Mr. Martin should visit the mining town of David, Ky., to mention only one of many.

**11.** **"Union bosses have their own little duchies . . . wherein they make deals with the operators. Enforcing safety would upset these deals."**

That is a serious accusation. Since Mr. Martin makes no express exceptions, it is directed at the entire industry —operators and union leaders alike. To uncover those who are guilty, to protect those who are innocent and to indicate the extent to which such callous trading colors the industry, Mr. Martin should document his charges. His allegation that all mine owners and union officers are unmindful of human life and limb is a smear on the great majority of honorable men who earnestly try to make mining safer.

Mr. Martin's story is a dramatic, crusading appeal for safer mines and better living for miners. Mine owners, mine workers and the union are on his side.

But he has made the miner's life uniquely dismal. Few miners, I believe, would agree that his story reflects their day-to-day routine fairly. They would agree, I believe, that Mr. Martin sifted his details and selected his impressions to create an effect that may have been justified 20 yr ago but is outdated today.

May I cite a few details that create this gloomy but misguided impression?

**12.** **"A young miner starts out for his work in the cold gray of the early morning."**

Coal towns have no monopoly on coal gray mornings, and there are warm, sunny mornings in coal towns as well as elsewhere. If the miner goes to work early, he also gets home in time to mow the lawn, feed the chickens, work in his garden or go fishing.

**13.** **"They ride a mile and a half through the main haulageway, dropping off at crosscuts and entries to walk to their work."**

To get to my working place, I ride two miles standing up in a crowded subway train, drop off at my station, and walk the rest of the way. Is that greatly different?

**14.** **"He must set timber props to support the roof, and if he does it ineptly or carelessly, he will die, and others with him."**

In short, carelessness exacts its toll. The principle is not unique to coal mining. It holds wherever men work with forces that do not yield easily to mastery.

**15.** **"In the bottom of his bucket is his drinking water, and if he spills it he must do without."**

And if I lose my billfold I must go without lunch, unless I can borrow a dollar from a friend close by. With more ease than I can borrow a dollar, Mr. Martin's miner can get a drink from a buddy on his crew.

**16.** **"A tall, thin, erect woman, almost gaunt, with burning eyes . . ."**

Sudden death and grief are sharply etched in the faces of many widows, whether they are widows of miners or of somebody else. Without in any degree minimizing a widow's sorrow and shock, it is only fair to point out that not all miners' widows are "gaunt, with burning eyes," or mentally unbalanced, as Mr. Martin's description connotes. When you knock at one door, you see whoever answers your knock. If you knock at the next door, chances are you will see a totally different person. You get distinct impressions of each. If, like Mr. Martin, you wish to create a mood or advance a crusade, you select the details and choose the words that fit your needs. That makes good reading, but it does not make sound reporting.

Very truly yours,

Wm. H. Haubenstock Jr.

ASSOCIATE EDITOR, COAL AGE

## *West Virginia Rediscovery:*

# Prehistoric Rock Pictures

THESE unusual examples of petroglyphs within a few hundred feet of the Guyandotte River were "rediscovered" last fall by a party of West Virginia archeological enthusiasts after being "buried" for more than 100 yr. Located near Salt Rock, Cabell County, the prehistoric drawings of unknown origin were first described by two archeologists, Squier and Davis, who, following reports from hunters and early settlers, visited the area in 1846. After cleaning off the moss "with sharp sticks" they sketched the figures for their book, "Ancient Monuments of the Mississippi Valley," published in 1848 and now available in the New York Public Library.

**1846 DRAWING** of unusual petroglyphs near Guyandotte R.

**1951 PHOTO** shows little deterioration after rediscovery. Figure of man is more than 6 ft tall.

The modern exploratory party, which spent most of the day cleaning the rocks with wire brushes and chalking them for photographing, consisted of Sigfus Olafson, mining engineer and president of the West Virginia Archeological Society; J. J. Adams, Fulton Tool Works; J. F. Durett, C. & O. Ry.; Conrad Ross Jr., a student; and J. H. Edwards, associate editor of *Coal Age*, who took the photos. The drawings were so obscured by bushes, vines and moss that few people born and raised in the vicinity knew of their existence. Although within 40 ft of the C. & O. right-of-way, the rocks by sheer luck escaped damage when the railroad was built 50 yr ago.

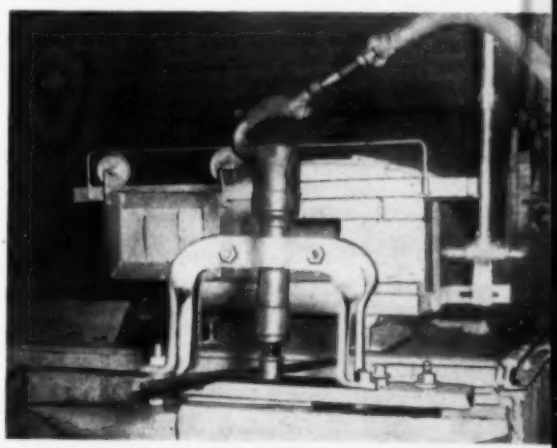
The rocks are a hard sandstone which shows little or no deterioration in the 106 yr since the petroglyphs were first recorded as some of the finest found east of the Rocky Mountains. The numerous drawings on the several rocks uncovered are believed to have been made by pecking with flint tools, rather than by chiseling. The figure of the man shown above is 6 ft 3 in high.

# Shop-Rigged Air Hammer Straightens 625 Bits an Hour

BITS CAN BE STRAIGHTENED as fast as a man can handle them with the compressed-air hammer rigged up by James E. Moore, blacksmith at Montour No. 4 mine, Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co., Lawrence, Pa. "To keep up with the great number of bent machine bits coming out of the mine, I had to do something to speed up the straightening," Mr. Moore writes. "It used to take two of us a full shift to straighten about 700 bits. After a day of this a fellow could hardly raise his arm." Now, with the hammer (right) and an oil furnace built to speed up heating, "We have done 625 an hour," he reports.

Figuring that the straightening could be done mechanically, Mr. Moore took two pieces of ½ x 2-in iron and shaped them to hold an ordinary air riveter in a vertical position, bolting the two pieces and the riveter to a section of 1 x 4-in iron about 16 in long. The whole frame was bolted to the anvil (one bolt through the hardy hole is enough). He then made a special pair of tongs which holds the bit tightly when picked up by either the narrow or wide sides. Operating at 100 psi with about 90 blows per minute, the hammer straightens the bits almost as fast as they can be inserted under it.

"After we got the hammer working we discovered we could straighten the bits faster than they could be heated and we then built an oil furnace," Mr. Moore says. It measures about 18 x 30-in on the outside and holds some 350 bits. The door, which rolls on wheels, can be partially closed during operation. Oil is fed through a small orifice by air at about 40 psi. This small furnace has been found helpful, too, for other heating jobs, while the air hammer has proved useful for making points on any small tools or iron and for making chisels also.



**More work-proved "Ideas" on pp 106, 108, 109.**

**1** **SWITCHBACKS** in haulage roads control grades to less than 8% to provide fast haulage in 30- and 34-ton trucks.

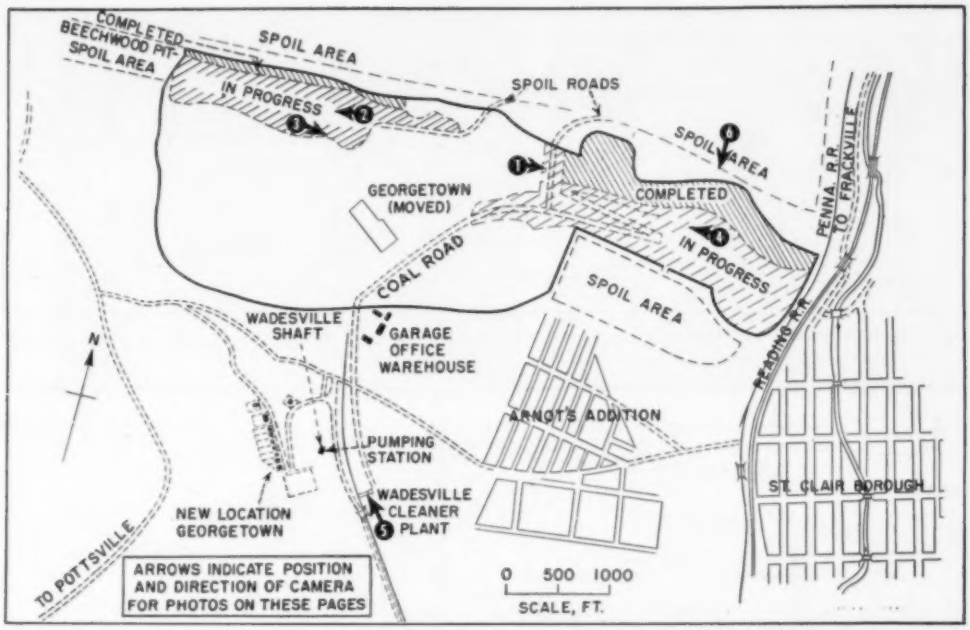
**2** **CHURN DRILLS,** two diesels and nine electrics, drill holes 35 ft deep to insure breakage of 30-ft bench.

**3** **TWO 6-YD ELECTRIC SHOVELS** remove 20,000 cu yd of overburden and 3,000 tons of coal in three shifts.

## Shovels, large trucks and churn drills—a team for better stripping . . .

**EAST-END OPERATIONS** are down almost to stripping limit, thus providing spoil room for future cuts.

**5** **ROUGH CLEANING PLANT** receives strip-mined coal which is hand-picked and crushed to minus 6-in.




**DETAILED PLANNING** for Wadesville included moving a small village and building a 4,000-gpm pumping station.

# The Wadesville Stripping

**How Wadesville Production Co. uses bench mining to remove 94,400,000 cu yd of overburden to recover 14,912,000 tons of coal. Two 6-yd shovels, 25 big trucks and 11 overburden drills now move material at a daily rate of 20,000 cu yd of rock and 3,000 tons of coal.**

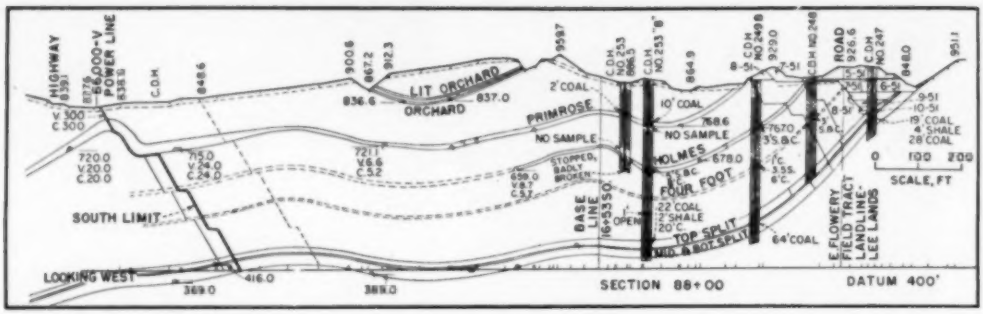
By HAROLD DAVIS
Assistant Editor, COAL AGE

**6** **WADESVILLE ENGINEERS** selected large trucks and flexible shovels to load and lift large tonnages out of the deep basin.

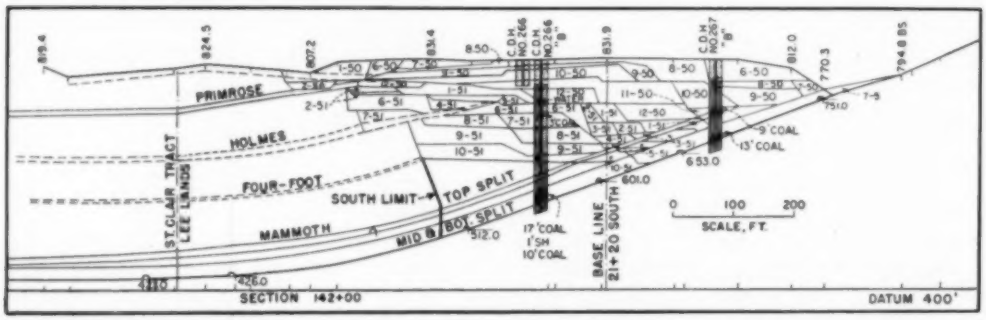
COMPLETE REMOVAL of overburden and anthracite from a property 6,400 ft long, 2,200 ft wide and up to 530 ft deep, a job that formerly required large scale underground workings in first mining, is the task undertaken by the management of Wadesville Production Co., a subsidiary of Shen-Penn Production Co. and "grandson" of the Philadelphia & Reading Coal & Iron Co. In this modern anthracite strip mine, located near the borough of St. Clair, Pa., 6-yd shovels, working both coal and overburden in 30-ft benches, load to large trucks (30- and 34-ton) which haul coal to a rough-cleaning plant and haul spoil out of the pit. As work progresses, spoil areas will become available in worked-out portions of the pit.

Bigger than Shen-Penn (February, 1949, *Coal Age*), Wadesville will require the removal of 94,400,000 cu yd of overburden to recover 14,912,000 gross tons of rough-cleaned coal from the Mammoth, Four-Foot, Holmes, Primrose, Orchard and Little Orchard

## Flexible machines, sound methods mark deep-basin stripping . . .




**WEST-END CROSS SECTION** shows coal to be recovered from six veins and the progress of the work to November, 1951.




**EAST-END CROSS SECTION** shows the sequence of removal of the benches according to definite plans

veins. Current rates of removal are 20,000 cu yd of overburden and 3,000 gross tons, rough-cleaned coal, per day. The mine was opened June 21, 1948, and up to Nov. 1, 1951, 11,450,000 cu yd of overburden had been moved to recover 1,008,000 tons of coal.

Wadesville was an engineering achievement before any coal left the ground, and engineering will be the keynote until the job is finished. Before opening the pit the company was required to move a village of 11 homes and a church, relocate a road to serve the village and make provisions for pumping water out of the old workings in the basin.

### PREPARING THE SITE

The village, called Georgetown, was moved ½ mi from its old location near the center of the property to a hilltop where it will not again be disturbed. According to the wishes of Georgetown's inhabitants, and under the solicitous supervision of G. A. Roos, vice president—operations, P&R, even hedges, shrubbery and fruit trees were transferred. There was a net gain for the townspeople because the homes were removed from pile foundations at the old site and placed on concrete-block foundations at the new location. In addition to the basements thus provided, new porches were added because the old ones could not be moved, and the homes were repaired as required.

## Officials & Supervisors—

### PHILADELPHIA & READING COAL & IRON CO.

Edward G. Fox, President
G. A. Roos, Vice President—Operations
George J. Clark, General Manager
W. C. Muehlhof, Chief Engineer
C. E. Brown, Mining Engineer

### WADESVILLE PRODUCTION CO.

F. W. Chesney, President
C. W. Fair, Secretary-Treasurer
E. R. Ermert, Chief Engineer
Joseph Petusky, General Superintendent
E. J. Haskins, General Foreman
F. C. Pearson, Electrical Superintendent
W. R. Kane, Superintendent of Maintenance
Ralph Long, Blasting Engineer

### POTTSVILLE DIVISION, P&RC&I

D. E. Ingersoll, Division Superintendent
W. G. Williams, Division Engineer

The new road is a macadamized thoroughfare laid by the company.

To remove water which would complicate stripping from the old workings, two Peerless pumps were installed at the head of Wadesville shaft, the opening from which the veins were formerly worked. The 2,000-gpm 350-hp pumps lift water 400 ft from the foot of the shaft to keep the workings dry.

### PLANNING THE WORK

Engineers of Wadesville and the parent companies considered many possible ways of removing the material before finally settling upon the 30-ft bench method. Shovels of medium capacity and large trucks were chosen to take advantage of their inherent flexibility, which is a necessity in bench stripping, as proved by experience at Shen-Penn where 25-ft benches are the rule.

According to plans, the property is being developed from the extreme east and west ends so that worked out portions may serve as spoil areas as the work moves toward the center. The spoil areas outside the pit, as shown on the accompanying map, receive spoil from the initial cuts. Thus, rehandling is practically eliminated for the life of the job. At the west end,

**F. C. PEARSON,** electrical superintendent, makes periodic inspection of high-capacity strip-mine pumping station which dewaters old workings.

**WADESVILLE SUPERVISORS**—E. R. Ermert (left), chief engineer; E. J. Haskins, general foreman; and W. R. Kane, superintendent of maintenance.

Beechwood stripping, which is worked by draglines by another operator, is nearing completion and will shorten the haul from that end.

## STRIPPING AND LOADING

At the time of the mine visit, a 6-yd P&H Model 1600 shovel in the east pit worked two shifts per day on overburden and one shift per day in coal. In the west pit, two 6-yd Bucyrus-Erie 170-B shovels worked three shifts on overburden. The three shovels are electric-powered, operating on 4,160 v, AC.

All rock in the intervals between veins must be drilled and blasted. Drilling is done by 11 Bucyrus-Erie 42-T churn drills, two diesel-powered and nine electric-powered, which drill 9-in holes about 35 ft deep on 18- to 20-ft centers both ways. The 35-ft holes, when charged and detonated, insure good fragmentation throughout the 30-ft bench.

Millisecond delay blasting is standard practice and rounds are detonated each day to keep highwall preparation on schedule.

## HAULAGE AND SERVICE UNITS

Spoil and coal are hauled in 25 Euclid trucks. Of these, 10 are 30-ton 6-wheel units and 15 are 34-ton 10-wheel Model FFD's equipped with twin 200-hp diesel engines. Each engine drives one of the rear axles through a torque converter and torqmatic transmission. Top speed is over 30 mph, loaded, according to clockings by Wadesville engineers, and automatic shifting and powered steering make it easier for the driver to efficiently handle these large units.

All haulage roads on the job are constructed with maximum grades of 8%, with switchbacks inserted to keep the grades under control. To increase safety, the trucks are driven on the left side of the road so that the driver may better judge his position in the traffic lane from his place in the left side of the cab.

**GEORGETOWN,** a village of 11 homes and a church, was moved 1½ mi from the center of the property to be stripped to this new location on a nearby hilltop.

Keeping the haulage roads in top condition are two Caterpillar Model 12 patrol graders. Five Allis-Chalmers HD-19 bulldozers and three 14-yd LaPlante-Choate motorized scrapers also are available for building and maintaining roads and for other general duties in the pits. Actually, the motorized scrapers opened the pit in 1948 by removing soft cover to the place where drilling and blasting became necessary.

## KEEPING UNITS AT WORK

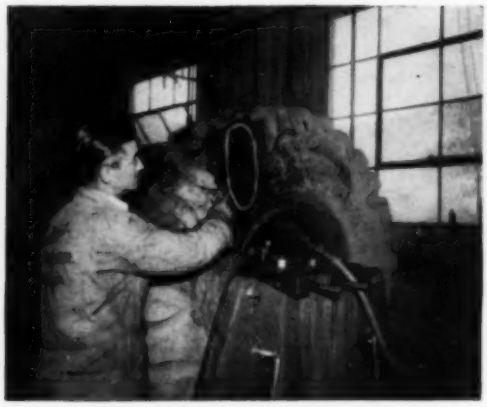
Trucks are brought to the shop in the service area in rotation for lubrication, oil changes, oil-pressure checks and so on. The oil-pressure checks serve as a guide in scheduling major overhauls, since a steady drop in oil pressure indicates the need for such action.

Strict inspection and maintenance schedules are followed to prevent the trucks from breaking down in the field, and service trucks are equipped to maintain the shovels and drills, which cannot be conveniently brought to the shop.

Crankcase drainings from the trucks is reclaimed at the Shen-Penn service center in Shenandoah, Pa., and returned to Wadesville to be used as makeup oil between scheduled oil changes.

Extra truck bodies are kept in reserve at all times because there is an economic limit to the tenderness that can be extended to strip-mine haulage

**PORTABLE WELDING SHOP** is placed over bulky units, such as truck bodies that cannot be handled in the shop.



**TIRE-REPAIR SHOP** is equipped to repair all tires in sizes from 5.50x17 up to 21.00x29.

**SCRAPERS, TRUCKS AND BULLDOZERS** receive major adjustments and repairs in this well-equipped shop in the Wadesville service area. Overhauls are done on schedule.

units. Therefore, when an oversize boulder damages a truck body to the extent that immediate repairs are required, the truck is driven to the service area where a crane replaces the damaged body with one that has been repaired and newly reinforced.

A portable welding shop, constructed of wood framing covered with corrugated steel and mounted on rubber-tired wheels, is pulled into place over the damaged truck body and repairs can proceed in all kinds of weather.

Churn-drill bits are resharpened in a Bucyrus-Erie bit-dressing machine.

In Pottsville, the company operates a tire-repair shop, which is equipped to repair all sizes from 5.50x17 to 21.00x29. The shop employs three men who rebuild casing gouges, repair inner plies and recap or retread small-size worn tires for the vehicles of Philadelphia & Reading and its subsidiaries.

At Wadesville, the parts-supply warehouse is stocked with replacement parts that are in frequent demand and with major replacement units such as engines, transmissions, radiator assemblies and so on.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## *By the Way*

**If your efforts are criticised, you must have done something worthwhile. If someone calls you a fool, go into silence and meditate, for he may be right.**

**If a dull day comes along, it gives you time to think out plans for making the next day brighter. If someone has put something over on you, remember there are more than 130,000,000 people in America who have never played you a single nasty trick.**

**If you have tried to do something and failed, you are vastly better than if you had tried to do nothing and succeeded.**

***The Morton Messenger***

### SUPPLYING POWER

A single 2,500-kva substation serves the electric-powered machines. The substation, which is fed from the 66,000-v lines of the Pennsylvania Power & Light Co., feeds 4,160-v power to the shovels through trailing cables. The electric drills are connected to 4,160/480-v portable substations.

Trailing cables receive special care because of their influence upon pit safety and economy of operation. Wood poles set into skid-mounted steel standards elevate the shovel cables over all travelways. Insulation weaknesses are quickly located by the use of a portable detector supplied by the Electrical Distributors Co., Philadelphia, Pa. Cable splices, jacket repairs and potheads are made in the electric shop at Wadesville. The shop is completely equipped with splice and pothead vulcanizing molds to handle all sizes of cable used on the job.

### PREPARING THE COAL

Wadesville coal is dumped into the feed hopper of the rough-cleaning plant which stands alongside a spur of the Reading R.R. The coal is hand-picked and crushed to minus 6 in, then loaded to railroad cars. Final preparation is done at St. Nicholas central breaker, Shenandoah, Pa., one of P&R's large cleaning plants.

## Opportunity for Coal Men . . .

# 1952 Coal Convention

### American Mining Congress, May 5-7, Netherlands Plaza Hotel, Cincinnati

**Monday Morning, May 5**

### Coal Utilization—Defense Developments

**New Developments for Coal Utilization**—Joseph Pursglove, Jr., Pittsburgh Consolidation Coal Co.

**Materials and Machinery for Coal Mines**—Charles W. Connor and Edward T. Klett, Defense Solid Fuels Administration; Harold A. Montag, Mining Machinery Div., NPA.

**Monday Afternoon, May 5**

### Roof Support

**Wet and Dry Drilling for Roof-Bolting—Compressed Air Drills,** C. E. Linkous, Island Creek Coal Co.; **Rotary Electric Drills,** L. F. Lumaghi, Lumaghi Coal Co.

**Roof-Bolting in Pillar Recovery**—James L. Gilley, USBM.

**Overall Economies of Roof-Bolting**—Donald B. Shupe, Coal Div., EG&FA.

### Strip Mining

**Overburden Blasting Techniques**—John L. Romig, Atlas Powder Co.

**Road Construction and Maintenance**—S. F. Sherwood, Central Indiana Coal Co.

**Rotary Drilling in High Overburden—Practices in Eastern Ohio,** J. S. Harmon, Hanna Coal Co.; **Anthracite Field,** Talhurst Butler, Central Pennsylvania Quarry, Stripping & Construction Co.

**Tuesday Morning, May 6**

### New Developments

**Breaking Coal at the Face With Chemechol**—R. D. Hedreen, E. I. duPont de Nemours & Co., Inc.

**Panel on Longface Mechanical Mining—The Sampson Stripper,** Richard Todhunter Jr., Barnes & Tucker Co.; **Meco-Moore Longwall Machine,** A. B. Crichton Jr., Johnstown Coal & Coke Co.; **Lobbe Coal Plow,** W. A. Haley, USBM.

**Auger Mining Underground**—Speakers to be announced.

### Underground Haulage

**Slope Sinking at Peabody No. 10 Mine**—Lyle Morris, Peabody Coal Co.

**Modern Underground Track Haulage Systems—Mainline Dispatching,** Walter R. Kirkwood, TC&I Div., U. S. Steel Co.; **Gathering and Service Haulage Operation,** B. M. Neel, Stonega Coke & Coal Co.

**Underground Belt Conveyors—Factors Affecting Operating and Maintenance Costs,** A. E. Long, Clearfield Bituminous Coal Corp.; **Central Shop for Belt Repairs,** W. A. Haslam, The New River Co.

**Tuesday Afternoon, May 6**

### Continuous Mining

**Symposium Covering Progress Review of Continuous Mining—BCR Coal Burster,** Gerald Von Stroh, BCR; **Goodman Mining and Loading Machine,** H. C. McCullum, Consulting Engineer; **Jeffrey Colmol,** Frank R. Zachar, Christopher Coal Co.; **Joy Continuous Miner,** Milton H. Fies, Alabama Power Co.

**Pillar Extraction With Continuous Machines**—J. A. Younkins, Duquesne Light Co.

**Tuesday Afternoon, May 6**

### Strip Mining

**Strip Mining in Deep Overburden—Methods in Bituminous Fields,** Arthur F. Lee, Traux-Traer Coal Co.; **Anthracite Field,** Paul Goddard, Carey, Baxter & Kennedy, Inc.

**Stripped-Land Rehabilitation**—Frank J. Foresman, Pittsburg & Midway Coal Mining Co.

**Stripped-Land Use Developments**—Thos. C. Cheasley, AMC Land Use Technical Committee.

**Wednesday Morning, May 7**

### Power and Maintenance

**Modern Lubrication Practices—Centralized Lubrication for Preparation Plants,** R. M. Johnson, Blue Bird Mining Co.; and additional speaker to be announced.

**Underground Power Transmission**—Urban F. Toucher, Union Pacific Coal Co.

**Maintenance for a Continuous-Mining Section**—J. J. Snure and G. W. Stump, Rochester & Pittsburgh Coal Co.

### Safety

**Prevention of Fires to Underground Conveyor Belts**—C. W. Thompson, Weirton Steel Co. Div., National Steel Corp.

**Handling Man-Trips From Portal to Working Sections—With Belt Haulage,** Don Conaway, Robinson & Robinson; **With Rail Haulage,** F. F. Stewart, Jewell Ridge Coal Co.

**Coal-Dust Control Underground**—R. Emmet Doherty, Anthracite Institute.

**Wednesday Afternoon, May 7**

### Coal Preparation

**Heated-Cloth Screening**—John E. Dunn, Allis-Chalmers Mfg. Co.; and Milo W. Summers, Westmoreland Coal Co.

**Preparation and Recovery of Fine Coal From Slurries**—James P. Blair, Heyl & Patterson.

**Dense-Media Separation by Tromp Process**—J. W. MacDonald, Old Ben Coal Corp.

### Special Events

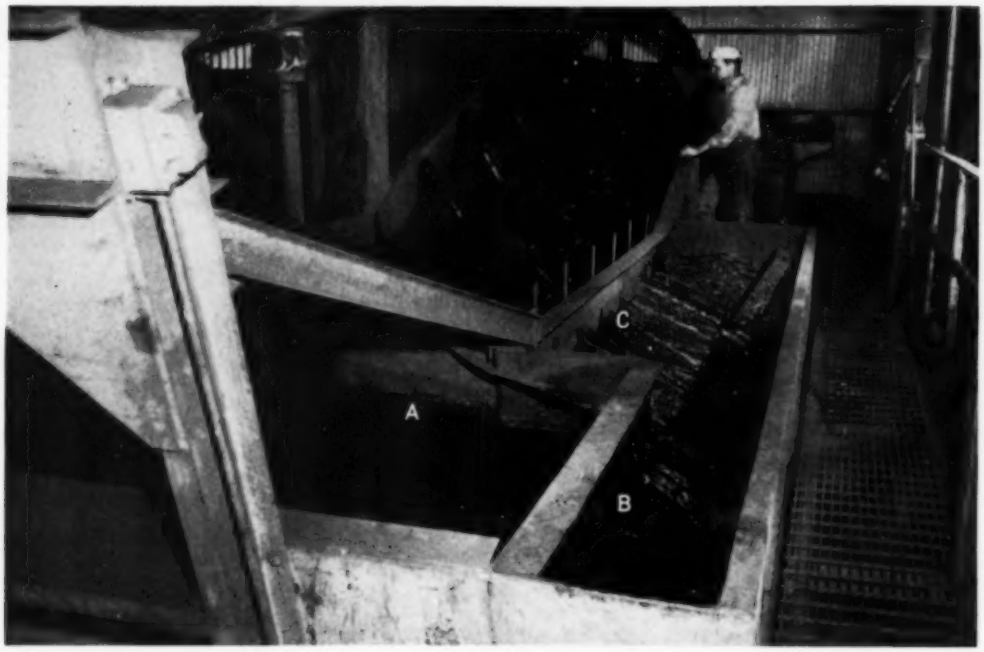
**Monday Luncheon**—Guest Speaker to be announced.

**Monday Evening—Coal Miners' Party,** Coney Island Amusment Park.

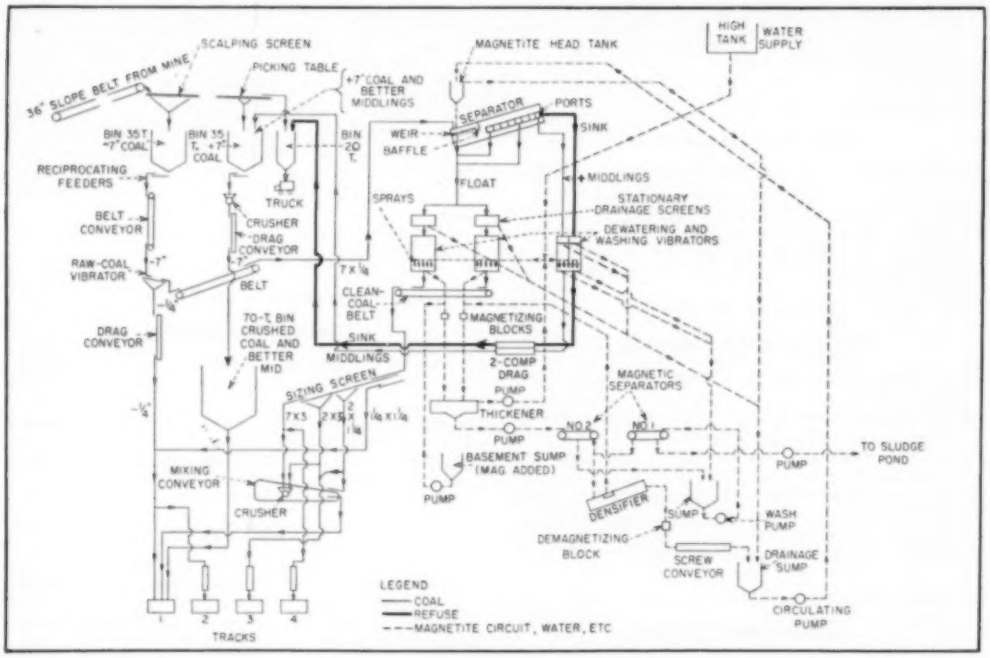
**Tuesday Luncheon**—Guest Speaker: Dr. Kenneth McFarland, General Motors Corp.

**Wednesday Evening—Annual Banquet,** featuring special entertainment.

## Efficient cleaning the goal in spiral use at Crystal Block . . .




**FIRST IN THE COAL FIELD** as a complete heavy-media washing unit, the spiral classifier makes three products. Key items are: A, baffle keeping float out of spiral chamber; B, sawtooth weir over which most of the float leaves the pool; C, series of ports drawing off float and middlings. The spiral is being checked by Joe Chalfa, washer operator.




**HOW SOLID MATERIALS** and washing medium flow in the new Crystal Block No. 3 tipple and washer.

**HEART OF THE NEW PLANT**—the spiral-type heavy-media unit is in the wing at the right.

**SERVED** by a slope belt and loading from five points on four tracks, the plant uses three belt-type booms.

## Difficult Washing Job Handled Efficiently by . . .

# Spiral-Classifier Cleaning

**First plant in the country to use a spiral classifier as a complete heavy-media unit, Crystal Block gets high efficiency in three-product operation with high magnetite recovery.**

By J. H. EDWARDS
Associate Editor, COAL AGE

EFFICIENT three-product coal washing and high magnetite recovery are achieved at a new tipple and washing plant of the Crystal Block Coal & Coke Co.—the first commercial plant in the country to use the Akins spiral classifier as a complete coal-washing unit. The new plant now makes it possible for the company to produce two types of coal from the same seam: one a high grade for domestic and industrial uses and the other a high-ash product finding a ready market at large steam plants.

The new plant serves No. 3 mine, at Rawl, in Mingo County, W. Va., which is one of the three properties operated by the company. The others are at Roth, Buchanan County, Va., and at Sarah Ann, Logan County, W. Va. The company was organized Feb. 1, 1910, and has been shipping coal for over 40 yr. J. M. Tulley, Huntington, W. Va., is now president and general manager.

Rawl is on the Tug Fork of the Big Sandy River 4 mi upstream from Williamson, W. Va. It is served by the Norfolk & Western. Present mining is in the 4-ft Pond Creek seam, which consists of 33 in of high-grade clean coal topped by 10 in of 25- to 30%-ash bone and 5 in of top coal. Cap rock 1 to 4 in thick is found over most of the mine and comes down with the coal. Joy machines delivering to chain conveyors or shuttle cars load the full seam and belts carry the coal to the slope bottom and then up to the tipple.

Before the new plant was built, three men picked on the belts, discarding the rock but piling the bone coal in the entry until a carload was accumulated. Then it was reloaded to the belt for separate handling in the tipple. In this old plant, two additional pickers were employed and the 3x2-in size was washed in a calcium-chloride unit.

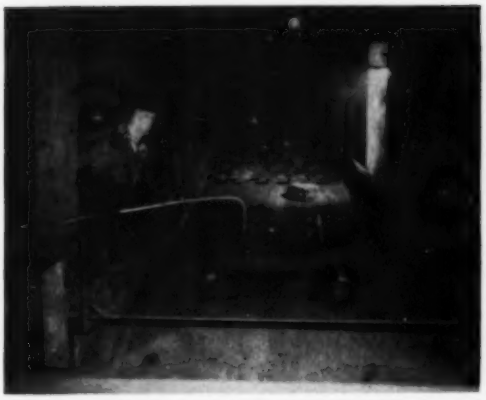
### BETTER COAL THE GOAL

Objectives in the design of the new plant were lower-ash coals, uniform quality and sizing, lower labor cost, higher preparation capacity and replacement of the old wooden tipple with a steel structure good for the 30-yr estimated life of the property. Six men, including Gerald F. Marlowe, plant foreman, now handle preparation and loading, against eight for the old plant. Roy Palmer is superintendent of the mine and outside operations.

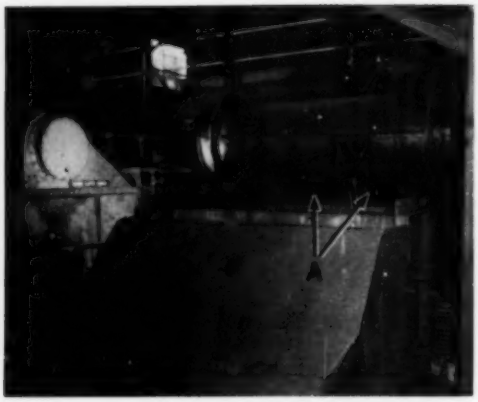
The heavy-media washing plant was designed by H. F. Lynn, of the Southwestern Engineering Co., Los Angeles. It was erected under Southwestern supervision by Interstate Engineers & Constructors, Fairmont, W. Va., which designed and built the tipple. The Akins spiral densifier used for coal washing, and the Akins spiral densifier used in the magnetite-recovery circuit, were both made for Southwestern Engineering by the Colorado Iron Works.

### SPIRAL-CLASSIFIER WASHING

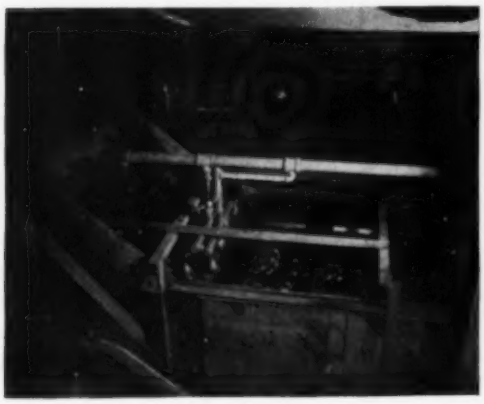
To start the preparation process, the slope belt delivers to a Parrish-type shaker with a 5x8-ft screening surface (7-in round holes), and a 5x13-ft picking surface. The 7x0 drops into a 35-ton bin. The picker pushes or hooks the coal and bone out of the



**COAL** from plus-7-in material is pushed or hooked into the center hole of the picking surface by J. W. Hatfield, picker.



**END VIEW** of vibrators dewatering and washing 7x¼ from the spiral separator. **A** indicates the washing sprays.



**TWO VIBRATORS** dewater and wash float. A third (left foreground), with divided deck, handles middlings and sink.

**WASHED** coal is discharged from belt to the sizing shaker. **A** indicates torque-arm gear reducer.

# Flexibility in sizing and loading matched by

plus 7-in into a 2x3-ft opening in the center of the picking surface leading to a second 35-ton bin. The plus 7-in refuse slides over the end of the picking table into a 20-ton hopper for disposal by a K5 International 1½-ton truck.

Minus 7-in coal fed out of the first 35-ton bin by a reciprocating pan is elevated by belt to a Robins Gyrex raw-coal vibrator, where the ¼x0 is screened out and taken by drag conveyor to the slack-loading chute over No. 1 track.

The feed to the washer is the 7x¼ overproduct from the raw-coal vibrator. An elevating belt delivers it to a chute where the water and magnetite medium washes it into the side of the pool of the Akins Type HMS spiral separator. The separator is rated to handle air input feed of 200 tph.

Turbulence in the pool is maintained by the flow of the medium and the rotation of the 66-in spiral at 6¾ rpm. From the opposite side of the pool, the float coat moves out over a weir with a sawtooth top to minimize medium outflow. A baffle extending down with its lower edge submerged keeps most of the float from entering the spiral section of the separator.

Ports alongside the spiral section provide adjustable draws for floats and middlings. The sink comes off at the elevated end of the spiral.

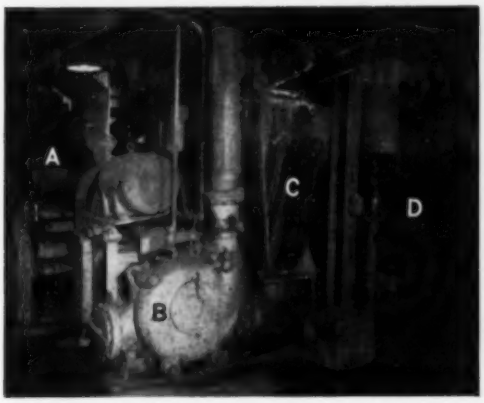
## DEWATERING AND MAKEUP

Floats from the pool and the first and second draws mix and then the flow is split to two flumes. The path of each stream is over a stationary drainage screen fitted with stainless-steel wedge wire with 1½-mm openings. The coal then goes to a 6x6 Robins Eliptex dewatering and washing vibrator with woven cloth having 1¼-in-square openings on the top and a stainless-steel punched plate with 1/32-in round openings on the bottom deck. A wire screen with ½x3-in slots is installed close above the plate for protection.

Middlings and sink are washed and dewatered on a third 6x6 Eliptex vibrator divided longitudinally through the center to keep the materials separate. Sprays on this screen, and on the clean-coal dewatering and washing screens, are supplied from the overflow of a Dorr thickener. Makeup water for the plant, aggregating 80

**SPIRAL DENSIFIER** in the magnetite recovery circuit returns material to sump for pumping to magnetite head tank.

**TWO NEW-TYPE MAGNETIC SEPARATORS** recover a high portion of magnetite removed from washer products.




**BASEMENT VIEW** showing drag conveyor (A), circulating pump (B) and thickener used in the recovery circuit (C).

**TIPPLE OPERATOR** F. J. Smith oversees the loading operation from the control desk overlooking the tracks.

# high medium recovery at Crystal Block No. 3

gpm, sweetens this overflow enroute to the sprays. The makeup is derived from a 200,000-gal hillside tank to which water is pumped from Tug Fork.

### MAGNETITE RECOVERY

Drainage from the longitudinally-divided vibrator dewatering and washing the middlings is divided across the screen. That from the first 3 ft. on both sides, together with the drainage from the stationary screens ahead of the coal vibrators, flows to a drainage sump supplying the circulating pump elevating to the medium head tank. Drainage from the main sections of the divided screen goes to No. 1 sump, discussed later in this article.

Separate drainage from each of the two clean-coal dewatering and washing vibrators passes through a rubber pipe—including a magnetizing block—and into a Dorr thickener 12 ft in diameter and 6 ft high. Thickened medium raked to the center is pumped to one of two new-type Dings HM-Crockett magnetic separators. These machines, with 48-in belts and built with undershot feed and integral tank and frame assembly, require relatively little floor space and are only 34 in high.

The magnetite recovered from the clean-coal fines by this first separator (No. 2 in the flowsheet) goes to an Akins densifier. The 36-in spiral of this machine operates at 1½ rpm. Overflow is recirculated to the Dorr thickener by joining it to the medium flow from the clean-coal dewatering and washing screens enroute to the magnetizing block. The magnetite discharged by the upper end of the densifier spiral goes through a demagnetizing block and then, via a screw conveyor, to the drainage sump from which the main circulating pump elevates to the magnetite head tank.

Tailings (water with non-magnetic solids) from No. 2 separator go to No. 1 sump. As noted earlier, this sump also receives water and magnetite from the sink and middlings dewatering and washing vibrator. From No. 1 sump, the fluid is pumped to No. 1 magnetic separator. The magnetite separated from the refuse joins that from the No. 2 separator enroute to the densifier.

Tailings from No. 1 separator, aggregating about 50 gpm and the only

J. M. TULLEY
Crystal Block president.

WILLIAM PHILLIPS
general mine foreman.

## Management team, Crystal Block No. 3

G. E. MARLOWE (left), preparation-plant foreman; R. F. Palmer, superintendent; and J. V. Powers, chief electrician.

waste water from the plant, are pumped to a sludge pond. This waste contains little or no clay.

New magnetite to maintain gravity is added in a basement sump below and to one side of the Dorr thickener. From this sump, it is pumped into the magnetite circuit at a point in the flow from one of the clean-coal dewatering and washing screens to the magnetizing block and Dorr thickener. The high recovery of magnetite reduces requirements to only 0.1 to 0.25 lb per ton of raw feed.

The five principal pumps in the plant are Model K Wilfleys. The sixth pump, made by Nagle, is a small vertical unit in the basement sump where the magnetite is added.

### COAL SIZING AND LOADING

Float coal from the dewatering and washing vibrators moves by belt to a Parrish-type shaker making four sizes. The 1¼x¼ flows to a chute over No. 1 track. The 2x1¼ can go to the loading boom at No. 3 track or onto the top run of a mixing conveyor encircling a McLanahan & Stone 18x24 single-roll coal crusher. The 3x2 can go to the No. 3-track loading boom or directly into the crusher. The 7x3 can go to the No. 4-track loading boom or into the crusher.

The bottom strand of the mixing conveyor to which the crusher discharges delivers to a chute over No. 1 track. The ¼x0 from the raw-coal vibrator and the 1¼x¼ washed can be mixed and diverted to the boom over No. 2 track.

Plus 7-in coal and bone pushed or hooked into the center opening of the picking table, and which goes with the better middlings from the washer into a 35-ton bin, are fed by reciprocating pan to a 24x36 McLanahan & Stone single-roll crusher. They then are moved by drag conveyor to a 70-ton bin. This crushed product, aggregating 10 to 15% of the plant input, is loaded separately on No. 1 track for shipment to large steam plants. Some of it goes as far as Indiana via railroad and Ohio River barges loaded at a rail-to-river terminal at Kenova, W. Va.

### CLEANING RESULTS

Although the mine-run feed to the Rawl plant runs 15 to 20% ash and presents a difficult cleaning problem, the results are excellent, with the sink containing less than 0.7% float. When washing at 1.47, the ash in the products runs approximately as follows:

| | |
|---|---|
| 7x3 lump | 6.28% |
| 3x2 | 4.93% |
| 3x1¼ | 5.18% |
| 2x¼ | 4.61% |

Mixing the 1¼x¼ washed with the unwashed ¼x0 results in a product with an ash of 7.4%.

Most of the electric motors in the plant are Westinghouse "Life-Line." Others are General Electric and Allis-Chalmers. The control board in the washer is a Cutler-Hammer factory-assembled unit. Tipple motors are powered through Westinghouse "Life-Linestarters" controlled from a bench board built by the West Virginia Electric Corp., Fairmont. Shaw-Box hoists control the three belt-type loading booms.

Heat in the washer section of the plant is supplied by a "Thermidaire" furnace-fan system built and installed by the E. K. Campbell Co., Kansas City. It is equipped with a Winkler stoker.

The mine has not as yet been developed to the tonnage the new plant is capable of handling. Both mine and plant operate one shift and the raw tonnage is 400 per day. All cutting is done with Jeffrey 35B shortwalls. The Joy machines load onto Jeffrey chain conveyors in two sections. In the third, a Joy 14 BU is served by 32 E shuttle cars. At present, the preparation plant is being operated at a rate of 125 tph.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

### *That Easy Life*

**Henry Ward Beecher once received a letter from a student asking his advice in the matter of an easy career in life. This is what the eminent theologian replied:**

**"Young man, you cannot be an editor. Do not try the law. Do not think of the ministry. Let alone all ships and merchandise. Abhor politics and do not practice medicine. Don't be a farmer, a soldier, or a sailor. Don't study. Don't think. None of these is easy. Oh, my son, you have come into a hard world. I know of only one easy place in it, and that is the grave."**

FAILURE'S RESULT—this fall of top rock was the result of failing to follow the standard timbering plan.

# Roof Falls Can Be Prevented

**Looking for a sure way to reduce roof-fall accidents? Adopt a good plan—*and follow it.* Beware of individual judgment.**

By G. G. GRIEVE
Staff Representative
National Safety Council, Chicago

ROOF-FALL ACCIDENTS need not contiue as the coal industry's biggest safety problem and the cause of more than half the fatalities. Many methods of preventing them are known. Yet, on the basis of exposure to the hazard, slight progress, if any, has been made in eliminating these accidents in the past 4 yr.

There is no panacea, no shortcut, in the roof-fall field. Excellent results have been achieved by the comparatively recent development of roof-bolting. Much of the success has been a result of uniform spacing of the bolts and their installation in line with established safe procedures. However, deviations from the plans and practices have been followed by serious accidents. Similar deviation from practice with conventional timbering likewise have been followed by fatalities.

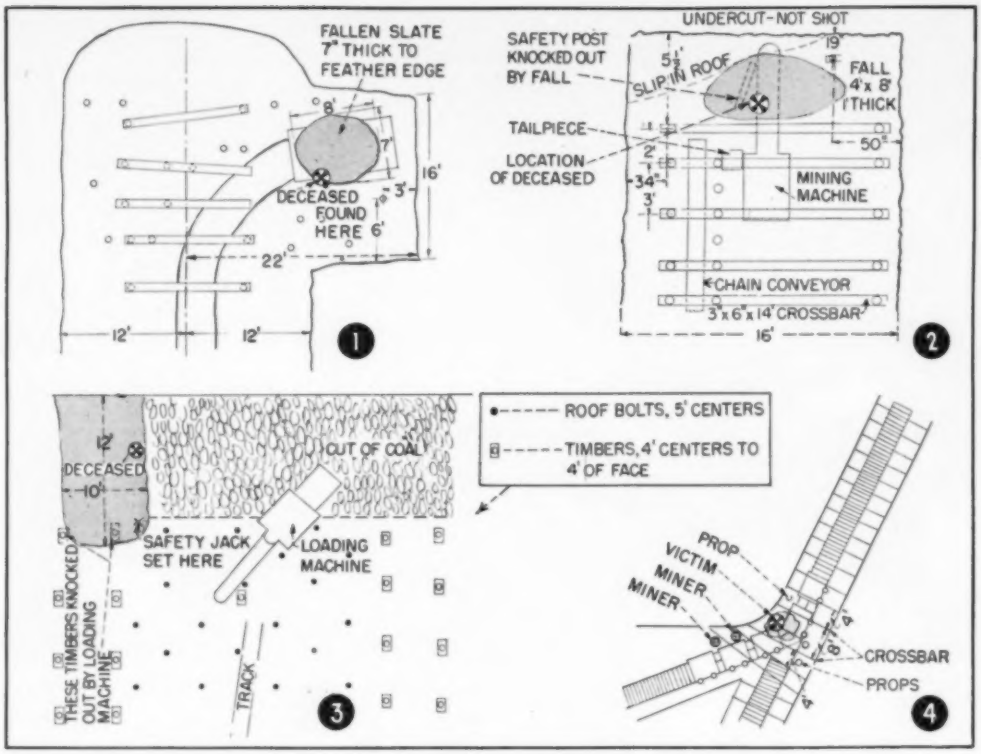
A National Safety Council study of the circumstances of 200 roof-fall fatalities, based on U. S. Bureau of Mines reports of investigations of accidents in 1950, shows that about two-thirds of them could have been prevented by adhering to a standard system of timbering suitable to the roof conditions encountered. The large companies—and many small ones—have such systematic timbering plans. Yet only 8% of the 200 deaths studied occurred at mines that did *not* have a systematic timbering plan before the accidents, and in all instances the mines were small. Hence the conclusion that a dominant cause of roof-fall fatalities was not failure to adopt standard timbering procedure, but rather *failure to follow the plan.*

## THE BASIC FAILURE

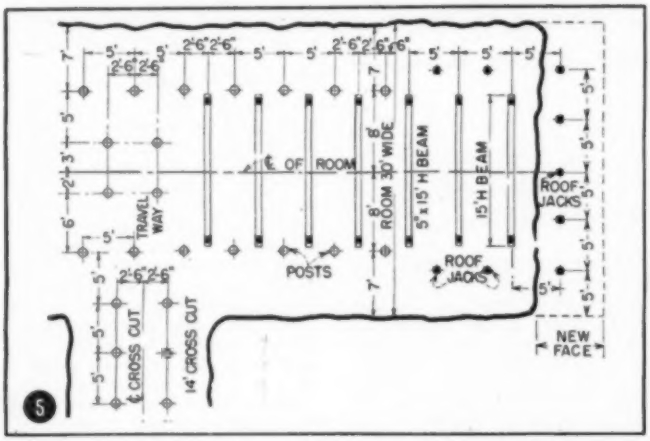
Standard timbering has not actually failed. Inadequate timbering systems and disregard of the requirements were the major reasons for at least 55% of the deaths. Investigation of the accidents shows that the age-old custom of relying on experience and judgment as to when, how and where timber should be set prevailed over the system. For example, variations from the specified spacing in the prescribed plans were so great that roof areas as large as 25 x 25 ft fell in mines where close timbering is essential.

A Bureau of Mines study shows that the average size of rock in fatal accidents is 12 ft long, 8 ft wide and 1 ft thick. The maximum spacing specified in standard timbering plans usually is 6 ft, and most plans generally require centers of 3 to 5 ft. Only in a few instances were the dimensions of the rock that fell less than the allowable spacing.

The futility of not setting posts, or




## DEVIATION'S PRICE–in each, death followed failure to keep to the plan.




**GOOD PLAN** providing good support. But even with this, a deviation caused a death, simply because compliance was not enforced.

of setting posts irregularly on the basis of judgment of the strength of the roof, is shown by the many accidents involving drummy roof, or roof judged tight enough to hold. The number of fatal accidents involving errors in judging the strength of the roof, based on tests and knowledge of roof conditions, was twice those where failure to test the roof was a factor.

The men and the foremen often agreed on the safety of the working places, and the foremen sometimes accepted the judgment of the men without testing the top. Though the timbering did not conform to the adopted plan, it generally was considered satisfactory.

### TIMBERING CAN BE IMPROVED

The analysis of 200 roof-fall accidents in 1950 reveals possibilities for improving timbering plans. One of the principal weaknesses is expressing requirements in general terms, thus permitting considerable freedom in judging requirements. Timbering plans frequently stated that crossbars shall be set "as needed" or "as required in the opinion of the section foremen and men." Furthermore, experience shows that some of these general requirements fail to provide for minimum safe support.

The circumstances of the following accident are typical of others resulting from these defects in timbering plans. The immediate roof in the mine in question consists of a band of black shale 4 to 8 in thick in which slips,

kettle bottoms and other irregularities frequently occur. The shale seems to draw away from the stratum above, and is taken down or timbered as the coal is removed.

The timbering system requires permanent posts on 5-ft centers and safety posts "close" to the face as the coal is removed. Coal thickness is 48 in. Crossbars are specified where the immediate roof, "in the judgment of the foreman and miners," appears to be broken or loose.

Crossbars were installed in the room up to the crosscut, as shown in Fig. 2. Then it was decided to change to posts at the crosscut, as permitted by the plan. Posts were set according to the plan. Although the roof sounded drummy, the section foreman and cutter operator still believed it would hold after a post was removed to permit loading the machine on the truck. Later, because of an undetected slip, a rock about 7 ft in diameter fell on the operator. The investigating committee concluded that if crossbars had been set, the accident would not have happened.

## INDIVIDUAL JUDGMENT FAULTY

The plan permitted the section foremen and men to use their judgment on the type of support. Their judgment in changing the posts was wrong, as was the judgment of men in other mines having similar general requirements. A good timbering system provides a separate specific plan for variations in roof conditions in different sections of the mine.

Also, in the case being discussed, the plan permitted use of posts where slips occur in the roof. Crossbars are far more effective than posts in preventing bad accidents where slips are present, and should be specified whenever possible. A specific requirement that crossbars be used is especially necessary when the roof over tracks contains slips, horsebacks, faults and other dangerous irregularities.

Most fatal accidents from roof falls occur in the face area, and it is here that timbering requirements are least specific and inconsistently permit larger areas of unsupported roof. For example, timbering plans state that "safety posts shall be set reasonably close to the face," and that "at least two posts shall be set between the permanent timber and the face."

After the deaths of cutter operators, shotfirers and men loading onto conveyors by hand, the weaknesses in the requirements were realized and timbering system were generally changed to require a crossbar within 2 ft of the face—when this method of support was used—before the coal was undercut. Likewise, where coal was loaded onto conveyors by hand and posts were used for support, the specified spacing was changed to "within 2 ft of the face," rather than "reasonably close to the face."

## Did You Know

**. . . That 92% of 200 roof-fall fatalities investigated occurred in mines that employed systematic timbering plans?**

**. . . That two-thirds of these fatalities could have been prevented by adhering to a suitable standard timbering system?**

**. . . That the average size of rock in fatal accidents is 12 ft long, 8 ft wide and 1 ft thick?**

**. . . That fatalities involving errors in judging strength of roof were double those where failure to test the roof was a factor?**

The inadequacy of "at least" two safety posts near the face is shown by the circumstances of another accident. The timbering system required "at least" two safety posts near the face and crossbars on 2- to 4-ft centers over the conveyors to within 7 ft of the face. Close timbering is necessitated by an immediate roof 12 to 18 in thick and composed of a fragile shale separated from the main roof by a 22-in coal rider. The coal bed is 36 in thick and is loaded onto conveyors by hand.

As shown in Fig. 2, the place conformed to the requirement of "at least" two posts near the face, and the distance between the last crossbar and the face was less than required. The men observed the minimum requirement of two posts but, as usual, only one prop was under the weak area.

The timbering plan was changed to provide for an additional crossbar with a center post to permit sumping the machine.

## DEVIATIONS DANGEROUS

Well-developed and specific timbering plans of some companies have failed because uniform support was not maintained during machine operation. The dangerous practice of knocking out posts without setting a safety prop, or prompt replacement of a post removed, accounted for about one-tenth of the fatalities.

The circumstances of another typical accident show how a good timbering system was nullified during the loading part of the mining cycle. The timbering plan for this mine provides for roof bolts in conjunction with conventional timbering, as shown in Fig. 3. Temporary safety jacks are set during loading and timbering. The coal is 36 in thick and the roof is a thin layer of shale 2 to 4 in thick.

In this instance, the two inby permanent posts on the left side were knocked out by the loading machine. The machine moved to the right before the posts were replaced, leaving a large area of unsupported roof. A laborer entered the place to shovel up the remaining loose coal at the left. He was given a safety jack, which he set near the roof bolts, as shown. He had walked about halfway to the face when the roof fell.

Standard timbering also is essential at the intersections of room necks with entries, crosscuts with rooms, and similar places with large roof areas. Fatalities were frequent at these locations in 1950.

A single variation from the timbering systems resulted in the accident shown in Fig. 4. The timbering was uniform at the approach to the intersection, where the space between crossbars was doubled. A slip developed in the roof at this point and resulted in the death of a miner working in the heading.

## WHAT GOOD PLANS DO

While recent roof-fall accidents show the need for improved timbering systems, the experience of companies with good plans is particularly significant. Fig. 5 shows a well-planned system for rooms mined with shaker conveyors equipped with duckbills. The coal seam averages 38 in, and the immediate roof consists of varying thicknesses of roof coal overlaid by several feet of shale containing pots, horsebacks and rolls.

The crossbars are 5-in steel H-beams supported by screw jacks. As the coal is loaded out, jacks are set 5 ft apart across the face of the room (closer in crosscuts). The two outby crossbars are moved forward with each cut of coal, and are replaced by posts.

A miner was killed by a deviation from this plan. The section foreman visited the place ½ hr before the accident and saw that the system was not being followed. However, he took no action.

Investigation of all these accidents has shown that a foreman was present at the time or had visited the place before the accident in about half the cases. He gave orders to follow the timbering plan in only a few instances. It is the day-by-day insistence on the precise execution of a good timbering system—first by officials and second by foremen—that will determine progress in eliminating roof-fall accidents in the future.

### Facts About the First International Conference on Underground Coal Gasification

**Place**—Birmingham and Gorgas, Ala., Feb. 12-14, 1952.

**Hosts**—Alabama Power Co., U. S. Bureau of Mines, Southern Research Institute, University of Alabama, Alabama Polytechnic Institute.

**Co-chairmen**—Dr. W. C. Schroeder, assistant director, U. S. Bureau of Mines, and Milton H. Fies, manager of coal properties, Alabama Power Co., consulting mining engineer, Bureau of Mines.

**Gasification Projects Abroad**—England, Dr. E. T. Wilkins, principal scientific officer, Fuel Research Station; Russia, Italy, Belgium and France, Julien Venter, director, National Institute of Coal Mining and Coal Utilization, Liege, Belgium; Roger Loisin, chief engineer, National Coal Research Board, Paris; Dr. Albert De-Smaele, chairman, board of directors, Socogaz, Brussels.

**Gasification in the United States**—James L. Elder, resident engineer, Bureau of Mines, Gorgas, Ala.; Dr. Erich Sarapuu, Sinclair Coal Co., Kansas City.

**Utilization**—Dr. Carl Bordenca, Southern Research Institute, Birmingham; Frederick Squires and Edmund S. Merriam, Champaign, Ill.

# Underground Gasification

## Progress • Problems • Prospects

"THE END OF THE BEGINNING has been reached. We're starting on the beginning of the end."

This summarizes the conclusions reached on the practicability of the process at the First International Conference on Underground Gasification of Coal, at Birmingham and Gorgas, Ala., Feb. 12-14. Highlights of the conference were as follows:

### GASIFICATION HISTORY

Great Britain apparently has the honor of being first to actively consider underground gasification. An experiment was planned in 1913, but was discontinued with the onset of World War I.

In the interval between the wars, Russia embarked on an ambitious program aimed at commercial-scale installations. Experiments were begun in 1932 and a state trust, Podemgaz, was set up in 1933. They continued work until the outbreak of World War II, and some evidence indicates that they resumed after the war.

Belgium organized Syndigaz in December, 1944. In 1947, the government decided to aid the program and Syndigaz was succeeded by Socogaz. This cooperative society organized two brown-coal experiments in 1947, at Valdarno and Terni, Italy, and followed these with a more-important experiment at Bois-la-Dame, near Liege, Belgium, in February and March, 1948.

Charbonnages de France, having studied the possibilities of a French experiment in 1947, made an agreement in May, 1948, for joint conduct of the Bois-la-Dame work. A similar arrangement followed with Charbonnages de Pologne, the Polish national coal trust. Under the supervision of a tripartite committee, with Socogaz as the executive body, a second experiment was carried out at Bois-la-Dame from November, 1949, to September, 1950.

In Morocco, the Residence Generale undertook an experiment at Djerada in 1947. A first attempt in November,

1949, was prematurely interrupted, and was followed by a second experiment lasting from August, 1950, to January, 1951.

The British again became interested shortly after World War II, and experiments were started near Chesterfield, in Derbyshire, late in 1949. Preparations now are being made for a second experiment near Bayton, in Worcestershire.

Study of underground gasification in the United States got under way in the latter part of World War II. The first experiments were undertaken by the U. S. Bureau of Mines and the Alabama Power Co. at the Alabama Power Co. property at Gorgas. The first was followed by two others beginning March 18, 1949, and June 28, 1951. The latter employed the electrolinking process developed at the Missouri School of Mines and tried in the field in cooperation with the Sinclair Coal Co., Hume, Mo., starting in 1950. Three or four other private experiments have been conducted elsewhere in the United States.

## GASIFICATION METHODS

Until the development of the electrolinking, electrocarbonization, and electrogasification techniques, the goal in underground gasification was reacting burning or heated coal air, oxygen, steam or mixtures of the three. Electrocarbonization, on the other hand, envisions actual carbonization of the coal by passing an electric current through it. One result is a much-higher Btu-content gas. Electrocarbonization can be supplemented with the passage of air, air and steam, or oxygen or oxygen-enriched air through the coke to complete the process, thus arriving at electrogasification.

Experiments so far have been carried out in coals ranging from lignite to anthracite in rank, in both thick and thin seams, and in seams varying from level to nearly vertical. Methods used to establish a fire or reaction zone involve either (1) preparation of places by actual underground work, or (2) establishment of fire zones by linkage between boreholes or other openings from the surface. Methods involving underground work include the following:

1. Driving chambers, leaving the broken coal in place and firing it.

2. Driving pairs of openings side by side or one above the other in pitching seams and then firing the face between. This and modifications, including U-shaped openings, normally are termed "stream" methods. A modification is putting boreholes or shafts and slopes down from the surface, connecting them with a gallery and then firing between them. Where a coal face is exposed, as in the side of a hill, the gallery may be replaced by a horizontal borehole to which vertical holes are drilled at intervals.

3. Driving pairs of openings and then drilling holes between them at intervals, firing the holes in turn.

The major disadvantage cited for most of the preceding methods is the large volume of work that must be done underground or elsewhere to prepare for burning. Consequently, increasing work is being done on shaftless methods, usually involving linking between boreholes from the surface. However, a modification is drilling inclined holes to the same point in V-fashion, firing the coal where the holes intersect and then burning back until the holes run out of the coal. The difficulty with this method is the necessity for leaving large blocks of coal unburned. Methods of linking between vertical holes include the following:

**1. Percolation,** or the use of natural cracks and crevices between holes (or other openings) to establish a fire zone.

**2. Pressure linkage,** using air or water to open up the coal or separate the coal from the roof and bottom, followed by igniting the coal between boreholes.

**3. Electrolinking**—the newest and considered by many as the most promising method, and used in the third test at Gorgas. Electrolinking involves inserting electrodes in boreholes and then heating the coal by passing current through it to establish a fire or reaction path. Continued application of power, or electrocarbonization, results in a reaction similar to that of a coke oven, yielding a high-Btu gas. Supplementing electrocarbonization with the passage of air or other gasifying agents to consume the coke and complete the conversion of the coal results in electrogasification.

## GASIFICATION PROBLEMS

Aside from the character of the products, the major difficulty in underground gasification is keeping air or other gasifying media in contact with the fire or reaction zone. In other words, the job is to prevent bypassing through the burned out area. Part of the problem is getting the roof and bottom material to come down or up and fill the voids as far as possible. Additional steps include introduction of sand into the burned-out area. The second major problem is keeping the system tight against leakage of air into it and leakage of gas out of it. Water saturation of the strata is one proposal. However, water in the reaction zone presents a problem in that part of the energy derived from the coal must be used to evaporate it.

## GASIFICATION GOALS

Underground gasification is seen as a means of recovering the energy content of seams too thin, too dirty or otherwise uneconomical to work by conventional methods. Furthermore, it is seen as a method of producing the energy locked up in the coal in a more-desirable form—perhaps at a lower cost than with normal mining methods even where conditions are fairly good. Major uses for the products are seen as follows:

1. A high-heat gas for general home and industrial use.

2. A low-heat gas for raising steam or operating gas turbines at or near the production site.

3. A synthesis gas for the production of synthetic liquid fuels or organic chemicals.

## GASIFICATION RESULTS

Depending upon whether air or mixtures of air and other materials are reacted with the coal, or whether the seam is carbonized by electric methods, the ultimate that can be expected is a gas quality equal to that possible in the usual producer-gas, water-gas or carbonization unit on the surface. In other words, the type of reaction determines the results, whether underground or in a gas-making plant, and the problem becomes one of whether the cost of the final gas is less by underground methods or by the conventional processes now in use. Work on underground gasification has proceeded to the point where it is believed it will have the advantage where the circumstances are right, and that a growing industry is possible.

Under stabilized conditions and using air alone, experiments to date indicate that gas with a 70- to 130-Btu content is entirely practicable. Such gas, also carrying latent heat, can be used for operating gas turbines or firing boilers at or near the site.

Using steam or oxygen, the Btu content can be raised to as high as 300. Prospects are that oxygen can be made for as low as $2 per ton and would cost approximately 10c per million Btu of gas produced. Use of oxygen also would reduce the length of the fire zone necessary for the production of a given volume of gas from, say, 3 to 6 mi in a 40 in seam to less than 500 ft in gasifying 1,000 tons per day underground.

If the coal could be carbonized underground, say by the electric process, the Btu content of the gas could be raised to 550 to 600 making it practicable for long-distance transmission.

Indications are that the recovery of the heat value of the coal normally will exceed 65 to 75%.

# Where you will find THE REAL REVOLUTION

**"If we keep in mind the values of opportunity, competition, democracy, productivity, then it is our capitalist society which is the truly revolutionary one – the only society which offers true hope to the masses for release from the long nightmares of tyranny. It is we, not the Marxists with their reactionary ideas of the good dictator, who have the truly constructive, the truly revolutionary ideal."**

*– from "Capitalism" by David McCord Wright.*

If we can only win recognition of this truth, we shall win the struggle of free men against communism. This editorial discusses some of the hurdles that must be cleared.

To win the needed recognition that "our capitalistic society... is the truly revolutionary one," we must keep pounding away both abroad and at home. That is because the communists simultaneously attack us on an international front and try to undermine us from within.

The present drive to rearm ourselves and our allies is crucial to our self-protection on the international front. We must be prepared to meet the armed force of aggressive communism with armed force if we are to secure our physical freedom.

### Arms are not enough

But to re-establish parity in arms is only half of the battle. In the last analysis it is not the more important half. To be effective, our arms must be backed by loyalty of men to our ideals. So, both abroad and at home, we must win men to the faith that we do have "the truly constructive, the truly revolutionary ideal."

On the international front, the effort to win adherence to such faith in our capitalist society meets tough going. That arises from the fact that in some of the countries that are allied with us in the fight against communism, capitalist society has offered to its people no such ideal. In varying degrees "the values of opportunity, competition, democracy, productivity" – those key aspects of American capitalism–are either absent or subordinated in their economic life. Indeed, the *Wall Street Journal* recently remarked that "to the European, capitalism has become synonymous with cartels – and with the disregard cartels foster for the consumer, the worker and the over-all well-being of the nation's economy."

### No Simple Solution

Nonetheless, many European labor and governmental leaders sincerely believe that cartels are essential to their economic salvation. They believe that without such restrictions in congested European markets there would be intolerable cut-throat competition and instability of employment. Thus, when we point out that the cartel capitalism so prevalent in Europe lacks the constructive qualities of competitive American capitalism, we may offend European leaders whose wholehearted cooperation we need in the fight against communism.

But, if we soft-pedal that contrast, we sacrifice the opportunity to win understanding and loyalty from millions of Europeans who have had no chance to learn that capitalism can be the constructive and liberalizing force that it is in the United States. Indeed, when many of these millions embrace socialism it is not because they love it. They are rather desperately seeking a tolerable middle course between what they consider the hateful extremes of communism and the undesirable aspects of capitalism as they understand it.

### New name not the answer

We know that there is no easy way to handle the problems created by such misunderstanding of American capitalism. Neither do we share the belief that much of the difficulty would be overcome if we were to call American capitalism by some other name. By doing that, the argument runs, we shall relieve it from the unpleasant connotations that are attached to the word capitalism in some other parts of the world. But, after all, if we are to give up all the terms that have come to mean something else in other parts of the world, we must begin by ditching the term "democracy" which, in the official jargon of the Kremlin, seems to mean what we call dictatorship.

In spite of the difficulties, however, we must stick to this job of exporting the truth that our capitalist system does offer opportunity, competition and democracy. We must let the rest of the world see that it means a continuous drive for increased productivity, and the search for profits by increasing sales and consumption, not by trying to sell less for more.

### Export alone not enough

The spreading of truth about American capitalism will not be effective if it is merely directed abroad. Unless it is carried on at home also, it will lack the driving faith that is essential to any convincing export of this type. Nor will export alone come to grips with the communist attack on our country from within—an attack that gets too much help from loyal Americans who short-sightedly repudiate the basic principles of our institutions in their efforts to reform some of their deficiencies. For success both at home and abroad, we must have right here at home a much more militant recognition that it is in fact our capitalist society which offers "the truly constructive, the truly revolutionary ideal."

Here at home, too, this raises difficult complications. Businessmen who are among the leaders and principal practitioners of capitalism, have generally been catalogued as conservatives. Hence, many people must stretch their imaginations a bit to see that businessmen are leaders of a development which has so greatly and so rapidly improved the lot of free men in America that it is truly revolutionary.

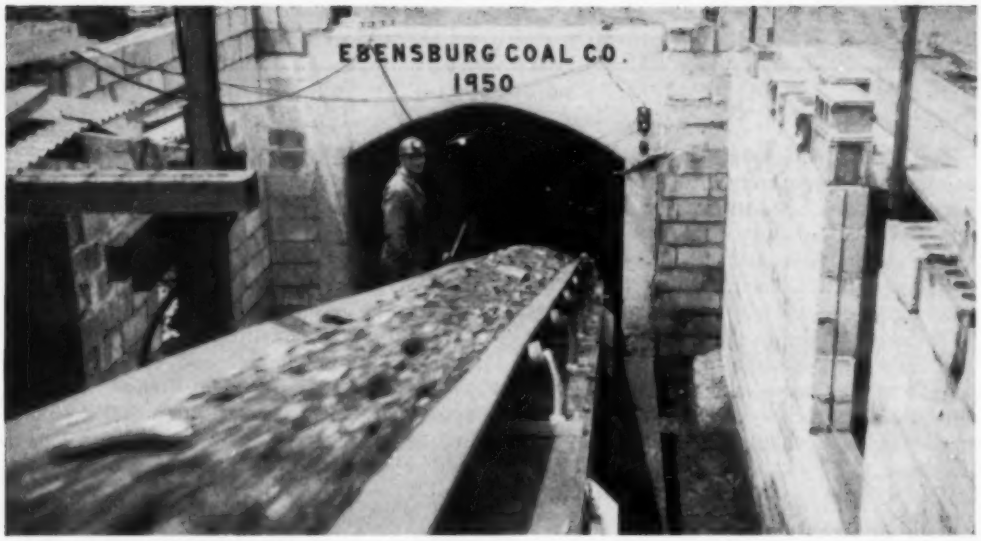
These difficulties of definition, however, are relatively superficial aspects of the problem of seeing our capitalist society clearly. The basic facts are that:

**American capitalism is leading free men to an ever higher material standard of living while respecting their spiritual, social and political freedom.**

**Communism is leading its people back into a life of servile regimentation under dictatorship.**

American capitalism advances to high ground never before attained by free men. Communism retreats to ground that men with an appetite for freedom throughout the ages have sought to escape. If we can establish this truth firmly, around the world, we shall no longer need to worry about communism. It will be hopelessly sunk.

***McGraw-Hill Publishing Company, Inc.***




**CONTINUOUS TRANSPORTATION** for sustained loading and efficient haulage on adverse grades are benefits of new 3½-mi Colver main belt system. Nearing completion is a covered transfer station and control room at slope portal.

# Automatic Elements Dominate Colver Belt Control

**Problem**—Control and protection of 3½-mi nine-unit mainline belt system

**Solution**—Automatic selective starting and protection, with controls for the control system as the final step in providing continuous main haulage

IN THE 40 YR since Ebensburg No. 1 mine at Colver, Pa., was opened, an area of almost 30 sq mi in the 42-in Lower Kittanning seam has been developed at the property. During the first 30 yr of its life the mine was a hand-loading operation, but in the last 10 yr a complete change has taken place. Now, every pound of coal is machine-loaded.

Operated by the Ebensburg Coal Co. from main offices at Philadelphia, Pa., and operating offices at Colver, the mine now is producing about 5,400 tpd in two shifts.

In charge at Colver is T. L. Aitken, vice president in charge of operations, and during Mr. Aitken's tenure in his present position the latest major changes have come about, including (1) the introduction of six Joy continuous miners and (2) the installation of a Hewitt-Robins belt conveyor system

**ALUMINUM-COVERED GALLERIES** house surface belts, like this one that carries coal from the portal to the 200-ton surge bin ahead of the tipple.

to transport coal approximately 4 mi to the tipple from workings in the northwest corner of the mine. The new belt eliminates a long track haul against adverse grades.

It is planned that about half the coal produced at Colver will be transported on the new belt, while the remainder, from sections in other parts of the mine, is hauled in 8-ton Sanford-Day drop-bottom cars.

A portion of the solid workings served by the belt is shown in Fig. 1. The general plan of development is as follows: The main opening is a 7-heading entry from which section entries (six openings) are driven approximately 2,000 ft apart. Butt entries are driven from the section mains on 700-ft centers, and rooms are driven both ways from the butts to recover the solid panel between. Development work is done by continuous miners, room work by continuous miners or conventional units and pillar recovery by conventional units.

Shuttle cars haul coal from the rooms to auxiliary belts in the butts and these discharge to a mother belt in the section entry. The mother belt discharges to the new main-haulage belt, which is installed in the heading previously used for hauling empties to the face. A parallel heading, formerly used for hauling loaded cars to the surface, now is maintained as a supply road.

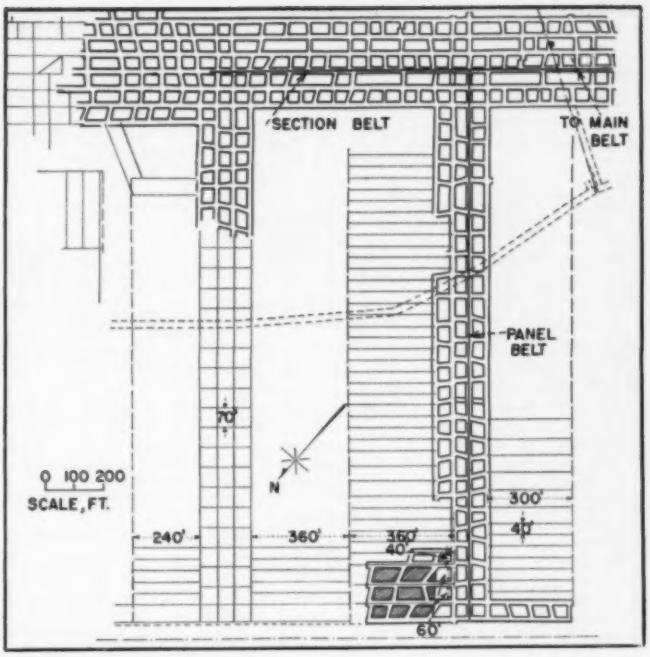



FIG. 1—**MINING SYSTEM** features short room hauls and effective belt use.

## HOW BELT IS INSTALLED

Since coal from other sections still is hauled through the original rock tunnel to the surface, it was necessary to sink a new slope as a belt opening. A 200-ft-long 12-ft-wide open cut was made through 52 ft of soft cover to open the slope, the sides of the cut being supported by steel piling until a reinforced concrete lining was constructed down to the rock. The open cut then was closed around the lining and the slope was driven through rock to a total length of 900 ft on a 16-deg 22-min dip.

The belt consists of nine sections, four with AC drives and five with DC. Starting at the tipple, the sections are:

Unit A-1, with a 30-hp drive, raises coal from the bottom of a 200-ton surge bin to the top of the tipple, where it is blended with coal hauled out of the mine in cars. At the surge bin the weight of the belt load is continuously recorded by a Merrick Weightometer.

Unit A-2, with a 40-hp drive, is installed between the slope portal and the surge bin.

Unit B is the slope belt. It requires a 100-hp drive and, like Units A-1

(*Continued on Page 104*)

**CENTRIFUGAL SWITCH** (left) stops all following drives if this belt is interrupted, while lever (arrow, right photo) trips limit switch to stop all following drives if an excessive surge of coal threatens to cause spillage at transfer station.

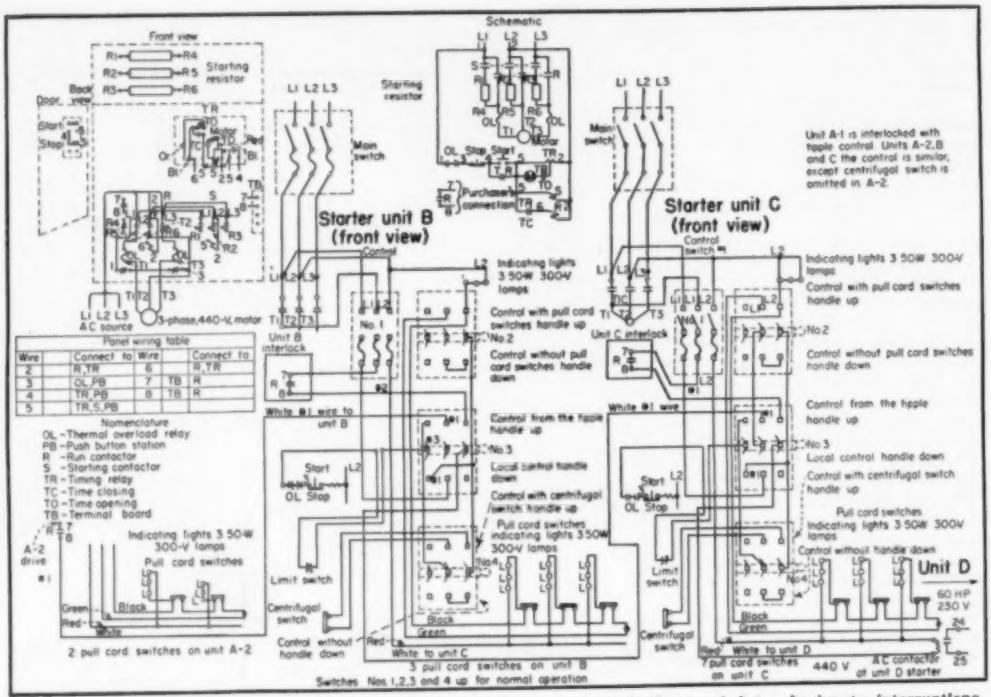

Front view
Starting resistor
Schematic
Starter unit B (front view)
Starter unit C (front view)
Unit A-1 is interlocked with tipple control. Units A-2, B and C the control is similar, except centrifugal switch is omitted in A-2.
Panel wiring table
Nomenclature
OL - Thermal overload relay
PB - Push button station
R - Run contactor
S - Starting contactor
TR - Timing relay
TC - Time closing
TO - Time opening
TB - Terminal board
Indicating lights 3 50W 300-V lamps
Pull cord switches
2 pull cord switches on unit A-2
3 pull cord switches on unit B
Switches Nos. 1, 2, 3 and 4 up for normal operation
Unit D
60 HP 230 V
440 V
A-C contactor at unit D starter

FIG. 2—CONTROL DIAGRAM for AC units shows how belts are automatically guarded to checkmate interruptions.

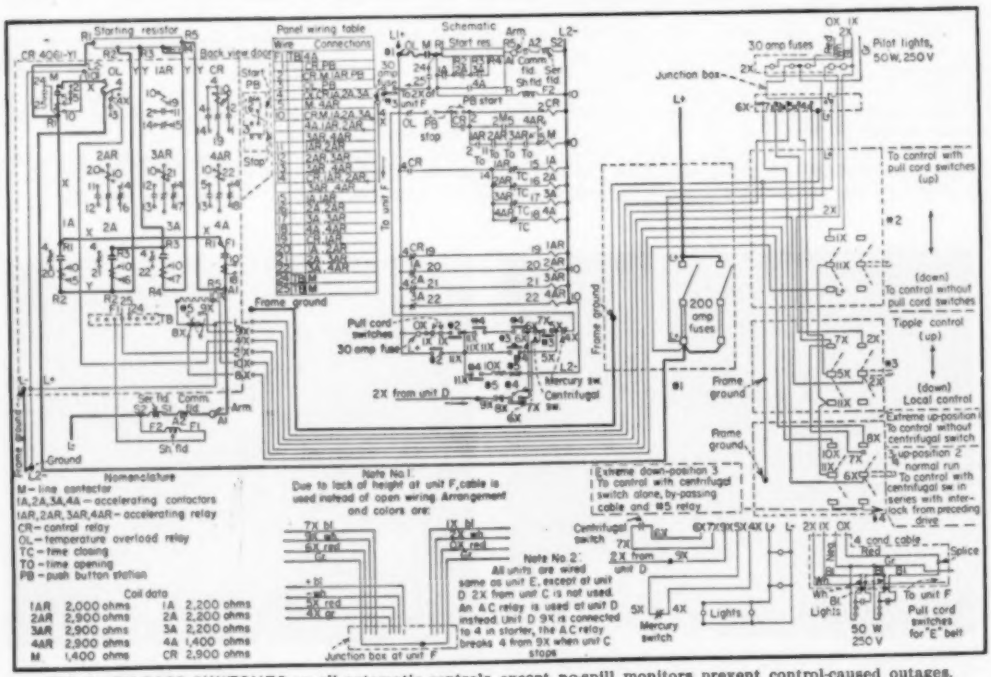



FIG. 3—BY-PASS SWITCHES on all automatic controls except no-spill monitors prevent control-caused outages.

# Belt-Control Problems and How Colver Solved Them

The control system for AC units at Colver, designed by Charles Reese, chief electrician, is shown in Fig. 2 on the opposite page and the control system for DC units, designed by Michael Sidwar, mechanical foreman, in Fig. 3. Point by point, here are the seven major control functions and how they are accomplished.

**1. PROBLEM: Connect each drive to the line through stepped resistance.**

**SOLUTION:** Each unit is equipped with a mainline switch and a control-circuit switch (No. 1), which are normally "on." As power is applied, accelerating relays short-circuit the starting resistance in successive steps, two steps for AC units and five for DC.

**2. PROBLEM: Start all drives in sequence from the tipple to the face.**

**SOLUTION:** Sequence starting is monitored by a timing relay in the control circuit of each drive which actuates the starting sequence of the next drive. Thus, demand on the power system is equalized because all units are not drawing current at the same time.

**3. PROBLEM: Automatically stop all following belts if any belt should stop for any reason.**

**SOLUTION:** Ensign centrifugal switches are incorporated in each control circuit to stop all following belts if for any reason any belt should stop. The centrifugal switch for each drive is installed under the preceding belt, about 35 ft from the tail pulley. If a belt stops, the rotation of the centrifugal switch stops, thus opening the control circuit of the following drive. Unit A-2 is not controlled by a centrifugal switch because it may be desirable to permit the system to discharge to the surge bin if unit A-1 is stopped temporarily.

**4. PROBLEM: Stop all following drives if any belt receives so much coal that spillage threatens to occur at the transfer point.**

**SOLUTION:** Spillage at transfer points is prevented by limit switches actuated by probe levers that project down into each transfer chute. If a feeder belt contributes an excessive load to a receiving belt the lever is displaced. The motion of the lever opens the limit switch contacts to stop the feeder and all following belts. The limit switches are mercury—or momentary—contact-type to permit automatic resumption of operation when the overloading is relieved and the lever returns to normal position. Mr. Sidwar developed this control.

**5. PROBLEM: Provide selective control that will permit operation of the entire system from the tipple or of each drive from its own control room.**

**SOLUTION:** Selective control of the system from the tipple, or of a single belt from its own control room, is chosen at double-throw switch No. 3. With the switch set for "local" control, the unit may be operated while others are idle. This permits one unit to be repaired and tested without running the other eight. On local control the unit draws directly from the continuous power cable which is installed along the belt line.

**6. PROBLEM: Provide a continuous "stop" control along the entire length of the belt so that a patrolman may stop a damaged belt, or one likely to be damaged, and all following belts at the moment he detects trouble.**

**SOLUTION:** Pullcords, attached to Schroeder Bros. Type MS (after Michael Sidwar) switches, are suspended along one side of the belt line. If a patrolman detects trouble, he has a "stop" control at hand. The switches controlling each drive are connected in series, and pulling any cord stops the affected drive and all following drives. The pullcord switch must be reset by hand, eliminating the possibility of someone else starting the drive from the control room before the trouble along the conveyor is cleared. Pilot lights in the control room indicate when the belt has been stopped by a pullcord switch.

**7. PROBLEM: Permit inoperative automatic controls to be by-passed without interfering with belt operation.**

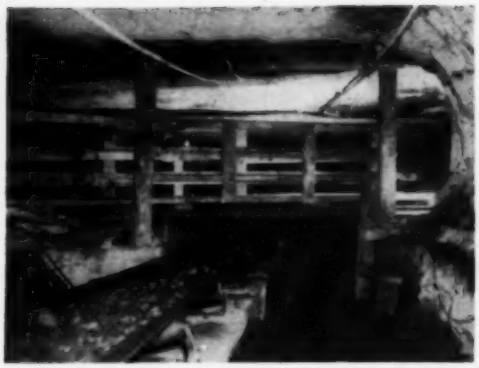
**SOLUTION:** Double-throw switches Nos. 2, 3 and 4 permit by-passing the pullcord switches, tipple control and centrifugal switches, respectively. No. 4 is modified to furnish three-way operation as shown in Fig. 3. These by-pass switches permit uninterrupted operation in the event of an automatic-control failure. No by-pass is provided for the limit switches at transfer points, however, because operating without a limit switch could result in an undetected pileup at a transfer point.

Finally, a push-button station on the General Electric CR 4061-Y1 panel at each control room adds another monitor to each drive. The start button is a maintained-contact control and must be pushed in to permit either local or tipple-controlled operation.

**CONTROL ROOM** for Unit E features good layout, adequate lighting and clearly marked controls for fast recognition.

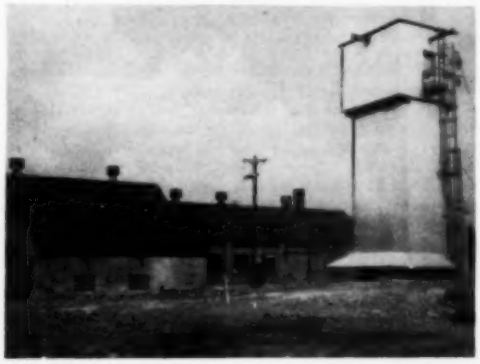
**SHORTENING THE HAUL DISTANCE** by almost a mile, the main belt turns the coal into line with new slope.

**PULLCORD SWITCHES** are a continuous, positive "stop" control on all belts including panel and section units.



**SUPPLY ROAD,** formerly used for hauling loaded cars, bridges main belt carrying coal to the foot of the slope.

**NEW FAN** on brick-curtained, two-compartment shaft is designed for ultimate capacity of 140,000 cfm.



**MANSHAFT,** equipped with automatic elevator, serves north-west sections, and marks Colver's progress.

and A-2, is a 36-in wide conveyor.

Unit C, last of the AC-powered sections, is the longest in the system, 3,400 ft, and is powered by a 40-hp drive. This unit and those following are 30 in wide.

Units D, E, F, G and H are powered by 60-hp 265-v DC Louis Allis drives. The AC units have 440-v General Electric Tri-Clad Motors. Belt speed of the 36-in units is 350 fpm, and of the 30-in, 400 fpm.

The direction of belt travel changes at the transfer point between Units C and D; all DC-powered sections are installed in the former empty road.

## HOW SYSTEM IS CONTROLLED

Considering the value and extent of the new installation, and its importance in the smooth operation of the mine, it is evident that an effective control system is required—and Colver has such a system. In the first place, three men per shift, one outside and two underground, patrol the belt line to lubricate idlers and drives, detect sticking idlers, maintain an unobstructed right-of-way and so on. Also, automatic controls are provided to protect the system from failures that patrolmen might not detect in time to prevent damage (see previous page).

Each unit is provided with a control room in a rib hole near the drive, where all switches, control panels, fuses and other electrical elements are conveniently arranged under adequate lighting. Control diagrams, similar to Figs. 2 and 3, and operating instructions are posted under glass at each control room as a ready guide to the wiring of that drive.

The junction box, mounted above the control switches as shown in the photo of the control room, is fitted with three fuse sockets and a pair of pullcord-switch pilot lamps. The fuse on the extreme left protects the cable leading from the interlock to the back drive against short circuits; the center fuse protects the lighting circuit in the vicinity of the drive and control room, and the fuse on the right protects the pullcord switches and cable.

The belt has carried a capacity load without trouble since it was placed in regular service in April, 1951, and a full measure of the credit for this performance is due the designers and installers of the control system.

Other recent improvements at Colver include a new Jeffrey Aerodyne 8H-72 fan on a two-compartment ventilating shaft and a new manshaft equipped with an automatic elevator. Surface facilities at the new shaft feature offices for supervisors, a modern changehouse and lamp station and an Airdox compressor room.

Assisting Mr. Aitken in discharging operating responsibilities at Colver are J. L. Banfield, chief engineer; William P. Smith, mine superintendent; Walter Angert, general mine foreman, and Joseph Gregg, mechanical supervisor. Merle Campbell, master mechanic, supervises the repair and rebuilding of Colver's numerous machines, including the continuous miners previously mentioned, 18 loading machines, 38 shuttle cars and 26 cutting machines.

# Exide-Ironclad BATTERIES

## ARE YOUR BEST POWER BUY— AT ANY PRICE

They PROVIDE ample power for fast, high-production haulage — more trips per shift, dependable round-the-clock performance, with no end-of-shift slowdown, no unscheduled down time . . . ASSURE inherent safety, with freedom from hazards of fire, fumes, noise . . . SHOW low costs of operation, maintenance, repair, depreciation. SIZES for all makes of battery-powered mine locomotives, trammers, shuttle cars. Call in an Exide representative, and let him prove these facts.

**THE ELECTRIC STORAGE BATTERY COMPANY**
**Philadelphia 2**

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# Operating Ideas

**CLOSED** TROLLEY GATE in place permits uphill locomotive operation and passage of low vehicles on road. Hinge is on the left end, with contact blade on the right. Trolley wire is 7 ft above the rail.

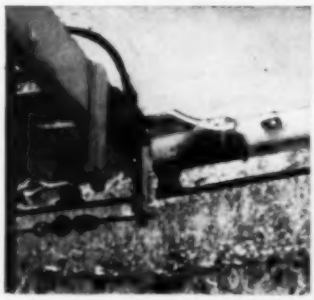
**OPEN** FOR PASSAGE of a high loaded truck, opening trolley gate cuts current from the 17-ft trolley wire. Formerly, supply locomotives going uphill had to make two starts and stops to attach a portable cable.

## Trolley-Wire Gate Solves a Road-Crossing Problem

A SAVING IN TIME and removal of a hazard are the benefits of a gate built in the trolley wire where a company road crosses a supply tramroad at the Indian Ridge mine of the United Pocahontas Coal Co., Crumpler, McDowell County, W. Va. Formerly, there was no trolley wire over the tramroad crossing, which is on a 3½% grade. Coming down grade on the supply track, trips could be coasted across. But on the way up, it was necessary to connect the locomotive to a portable cable, which required two stops and starts.

Now, with the gate closed, a trolley wire 7 ft above the rail spans the crossing. Supply locomotives no longer are delayed and neither are low road vehicles. With a high loaded truck, the driver stops, opens the trolley gate and then closes it after crossing the track.

The trolley gate consists of a 2½-in pipe 17 ft long to which a trolley wire of the same length is held by clamps without insulators. The gate hinge is placed in an offset position above the pipe and there is no electrical connection at that end. Since the electrical connection at the other end is broken when the gate is opened, both the pipe and wire are then dead. A guy wire that keeps the pipe from sagging when opened has a hinged anchor 4 ft above the pipe hinge and an insulator and turnbuckle near the lower end.



ELECTRICAL CONTACT BLADE on the 2½-in pipe (left) slides into spring-mounted jaws. Hinge (right) is offset above the pipe. For moving the gate, an insulated hook is hooked into the eye welded to the pipe.

The contact supplying power to the gate trolley wire is on the opening end and consists of a copper blade which slips into spring-supported contact jaws. An insulated wooden switch hook is used to open and close the gate, hooking into an eye welded to the pipe. The wooden hook is kept in a handy place, hanging on one of the gate posts.

**LET US KNOW about your good "Operating Idea." COAL AGE will gladly pay you $10 or more for each usable idea, on publication. Write: The Editor, COAL AGE, 330 W. 42d St., New York 36.**

## Hexagonal Shank Bits for Drilling Holes for 2-5/16" Diameter Tubes

Kennametal Hexagonal Shanks in sizes of 7/8" and 1⅛" provide strong bit construction for drilling larger diameter blast holes. They also enable the bits to withstand heavier pressure when they are being used on large drills for drilling hard impurities.

●

## Jack W. Begley is New Kennametal Representative

Jack W. Begley has been recently appointed Kennametal sales representative for southern West Virginia, western Virginia, and eastern Tennessee. Mr. Begley has worked in and around coal mines since the age of 16 and he takes over this assignment 1½ years after being graduated in mining engineering from the University of Kentucky.

●

## "First Aid" to Ailing Drill

Whenever you have trouble with drilling or cutting, "just call your Kennametal representative." He's an expert on these matters—and must be. He devotes all his time to them, and is a veteran coal mining man to boot. When one operator in Central West Virginia had a few armatures burn out, he called Jason C. McGuire, our local representative. After giving conditions the once-over, it was obvious that the bits were not being properly reconditioned. They were losing gage, and not allowing sufficient clearance for the auger. The problem was solved in a short time by giving the bit grinding man the proper instructions for the particular drilling conditions that were being encountered down at the face. It was a small, but important matter. But frequently little changes can make an appreciable difference in operating cost. Always depend on your local Kennametal representative for matters like this. He's glad to be of service.

●

## Web Core Breakers in Coal Drill Bits

A special feature of the large diameter Kennametal Drill Bit is a web core breaker. It extends from the center of the bit to the base of the tip. Being offset, it breaks up solids through pressure and impact.

Kennametal carbide tip slotted to an angle of 30 degrees increases bit life in hard roof, reduces dust, and enables straighter holes to be drilled.

A new angle in roof drilling is the 30 degree recessed slot now available in improved Kennametal Style HFD Bits. This new feature strengthens the bit, enables it to drill long footage in hard materials. Operators who have used the new design report 30 percent more footage in hard roof, less dust and straighter holes.

This type insert is an exclusive feature of Kennametal HFD Bits that make them the most dependable bit in the field for low cost drilling. Their advanced design, together with the hard shock and wear-resistant Kennametal cutting edge, assures long footage per bit life, lower actual drilling cost, and maximum drilling speed.

Your local Kennametal representative — who specializes in recommending the best tools for the job at hand—will be glad to demonstrate in your mine. Why not contact him on your next drilling (or cutting) problem? Kennametal Inc., Latrobe, Pa.

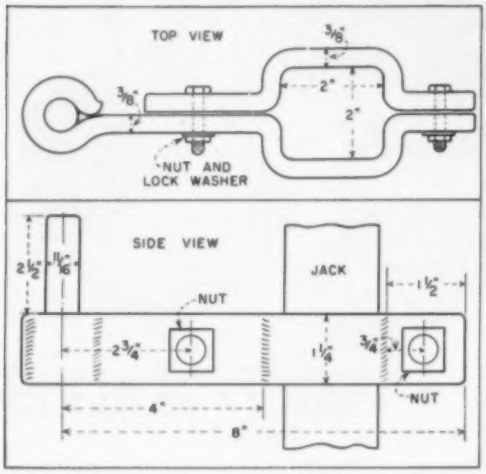
KENNAMETAL®

Quality Carbide Of The Coal Industry

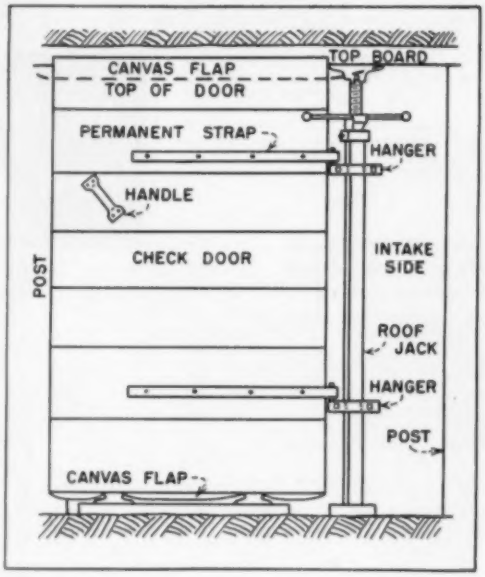
*World's Largest Manufacturer of Tungsten-Carbide Mining Tools*

(Advertisement)

# Roof Jack Supports Portable Check Door




**HANGERS** are made from two pieces ⅜x1¼-in steel which are shaped to fit snugly around the body of the roof jack.



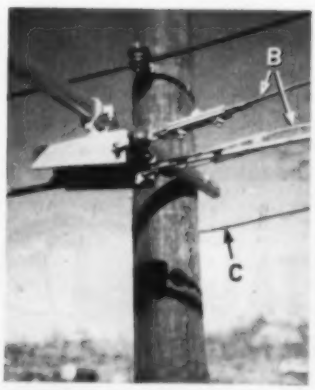

**ADJUSTABLE HANGERS** on roof jack support check door which must be frequently moved in advancing entries.

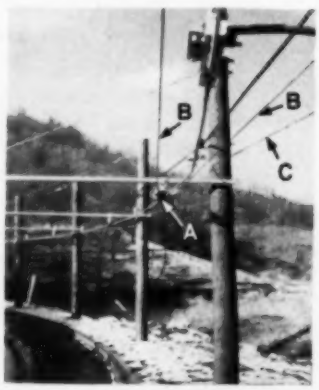
A CONVENTIONAL ROOF JACK and a pair of shop-made adjustable hangers provide an easily moved support for a check door which must be carried forward with advancing entries, writes Harry Northover, Washington, Pa.

As shown in the diagrams, a pair of hangers are secured at the proper height to the body of a roof jack by a pair of through-bolts in each hanger. Hinge pins on the hangers receive the eyes which are formed into the permanent straps on the door. A topboard and brattice-cloth flaps seal the openings around the door to prevent air leakage and the door closes against a roof-support post.

When it becomes necessary to move the check door, one man can do the job. Setups have been made in 30 min, Mr. Northover reports.

# Strain Plate Anchors Trolley Wire Near Headhouse




**STRAIN PLATE** adjacent to headhouse is attached by a pivot to a crosspipe (left), with view from headhouse (right). "A" is the strain plate (right photo); "B" the guy cables to the plate (both photos); and "C" the cable holding the pullovers.

USE OF A STEEL STRAIN PLATE shaped like a trolley guard solved a problem in new trolley construction at the Indian Head mine of the United Pocahontas Coal Co., Crumpler, W. Va. Drop-bottom mine cars are employed and the dump hopper is located on a curve. Since it was not feasible to anchor the trolley wire to the framing of the light steel shed covering the dump hopper, it was necessary to provide anchorage to the poles.

The top of the plate has a pivoted attachment to the clamp supporting it from the crosspipe. Two trolley hangers are fastened on the underside of the plate, with the clamps soldered to the trolley wire. Two guy wires attached to the flange of the strain plate anchor the plate. Since the guy wires slope upward from the plate, it was necessary to adjust their attachment to avoid a tipping action and several holes were thus provided in the plate flanges so that the points of attachment could be raised or lowered to obtain the right effect.

Pullovers on the curve on each side of the strain plate are anchored by a steel cable which is laced around the back of the poles. With this combined arrangement, the trolley wire is held in effective position.

HAULAGE WAYS *Jr.*

# O-B COUPLERS *Teach Safety* at HARWICK MINE

O-B couplers play an important part in the "Safety First" program at Harwick Mine of the Duquesne Light Company, Pittsburgh, Pa. In one phase of their employee training schedule, Harwick safety engineers show each new man on the job how to couple and uncouple cars. Stress is placed on the fact that it is unnecessary to stand between cars equipped with O-B Automatic Mine Car Couplers. Employees are also shown how to uncouple cars by raising a lever close to the side of the car. With safe operation like this being possible – throughout the mine as well as in coupling – Harwick is able to maintain an excellent safety record.

The safety feature in O-B Automatic Mine Car Coupling deserves your consideration. Self-guiding, self-locking couplers remove the need for manual guidance in the between-cars danger zone. They release manpower for other important work along the haulage way. Keep them in mind for your cars!

Ohio Brass

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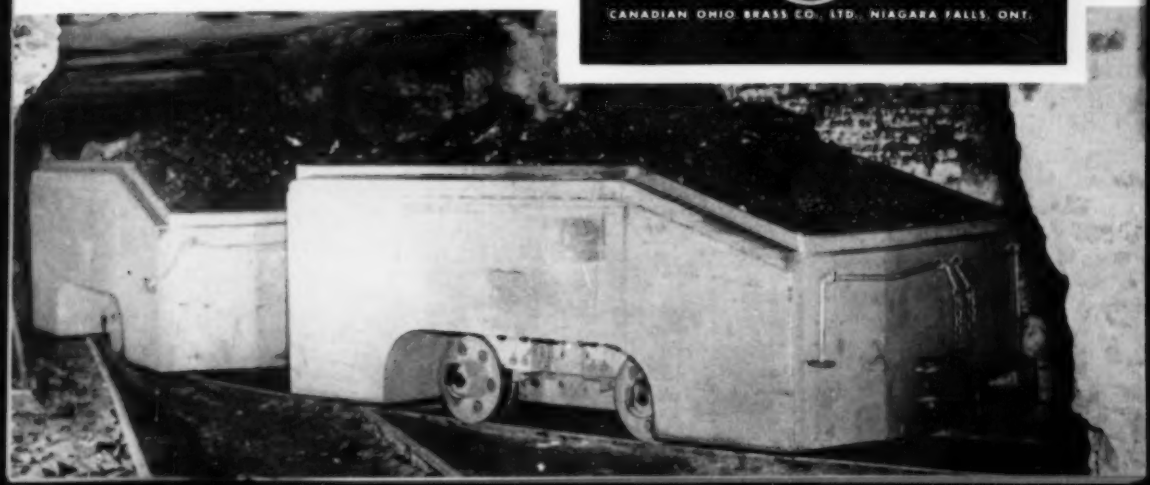
CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.



HAULAGE WAYS *Jr.*

# *Bump-Free*

## WIRE MAKES HIGH - SPEED COLLECTOR PATH

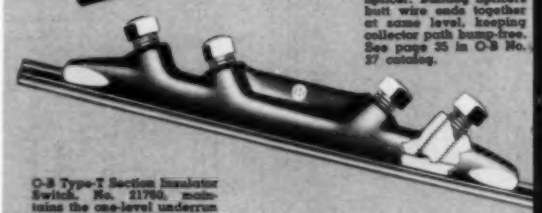
Overhead trolley wire can be the smoothest high speed path for your current collectors when O-B trolley wire fittings are used! O-B Shoes zip through an O-B overhead system without jouncing, arcing, or dewirements.

There's a good reason for such slick collector performance – NO BUMPS IN THE COLLECTOR PATH. Every O-B High Speed trolley wire fitting holds wire by its upper lobe, leaving a smooth path for the collector. Wire is led into and away from frogs and switches in line with the underrun surfaces of those fittings, so there's no jog in the transition from wire to hardware.

Coal moves faster; collectors and wire last longer when bump-free O-B Trolley Materials are used for replacement and new overhead construction. Use them to build a slippery slide for your motor shoes!

Type-M Frogs maintain smooth underrun for current collectors. Frog runner is of same contour as trolley wire, and joins wire at wire level. See page 36 in O-B No. 27 catalog.

Jaws of the O-B Bulldog Trolley Wire Clamps grip wire firmly, yet allow generous clearance for the current collector. See page 29 in O-B No. 27 catalog.



O-B Bulldog Trolley Wire Splicer. Bulldog Splicers butt wire ends together at same level, keeping collector path bump-free. See page 35 in O-B No. 27 catalog.

O-B Type-T Section Insulator Switch. No. 21780, maintains the one-level underrun with an adjustable center runner which is adjustable to wire level after the trolley wire has been clamped in place in the end runners. See page 63 in O-B No. 27 catalog.

*Smooth-Riding*

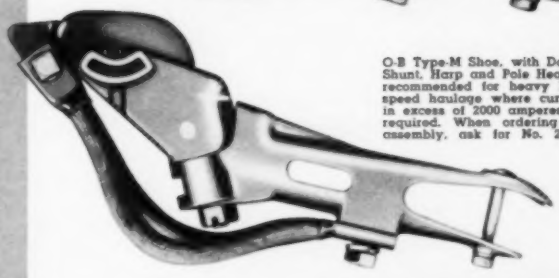
# O-B SHOES

## HUG TROLLEY WIRE

Shoes are the thing for high-speed haulage – slick-acting, wire-hugging O-B Shoes – that whisk along the trolley wire with never a jounce or arc. Even when they ride through frogs or section insulators and back onto the wire, there's no arcing or burning, for O-B Shoes pivot in their harps to maintain constant contact.

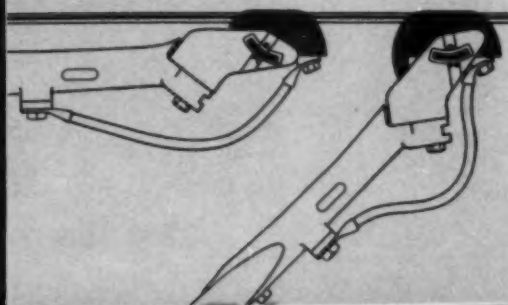
Take your choice, depending on current requirements: the Type-L, for amperages up to 2000; the Type-M for currents in excess of this amount. Either one is a smooth performer on overhead trolley wire!

O-B Type-L Shoe, with Shunt, Harp, and Pole Head, is recommended for most high-speed mine haulage service. When ordering the assembly as shown, specify No. 19399.



O-B Type-M Shoe, with Double Shunt, Harp and Pole Head, is recommended for heavy high-speed haulage where currents in excess of 2000 amperes are required. When ordering this assembly, ask for No. 22132.

Curved bearings used with O-B Shoes place the shoe turning axis in the center of the wearing surface between wire and shoe. This arrangement does away with any tendency for the shoe to tilt because of friction. It also allows a shoe to maintain full-length contact at various wire heights.



**Ohio Brass**

MANSFIELD (B) OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

HAULAGE WAYS *Jr.*

# Easy Installation
# Simple Maintenance
# O-B RAIL BONDS

The AW-8 Rail Bond is applied to the rail head by steel arc-welding. The terminal design reduces possibility of injury from car wheels.

The AW-20 is a typical long bond used to span long joint plates. It is one of four O-B bonds for that purpose installed by steel arc-welding. Other O-B joint plate bonds are mechanically applied or welded with copper alloy.

## *the important parts of a good rail bonding job*

Long-lasting, minimum-resistance O-B Rail Bonds in your return circuit are one of the most important factors in your track bonding program. Their easy installation lets your bonders work to the best of their ability; their durability under hard haulage traffic makes bond maintenance work a negligible part in the upkeep of your haulage system, and their low electrical resistance holds voltage drop to a minimum even at the farthest points in the haulage way.

There's a standard type O-B bond for every bonding application throughout your haulage system. Each one gives you the benefits of easy application, low upkeep, and minimum voltage drop. Learn more about them from your O-B No. 27 catalog or from your O-B representative.

Under the rail base, these AW-19 bonds are out of the way and well protected. AW-19's are installed by arc-welding with steel rod; AW-19's for the same application are arc-welded with copper.

An excellent mechanical bond for temporary or permanent use, the O-B Wedge Bond is easy to handle and install. Reclaimability and repeated use are two of its features.

*Ohio Brass*

MANSFIELD OHIO, U. S. A.

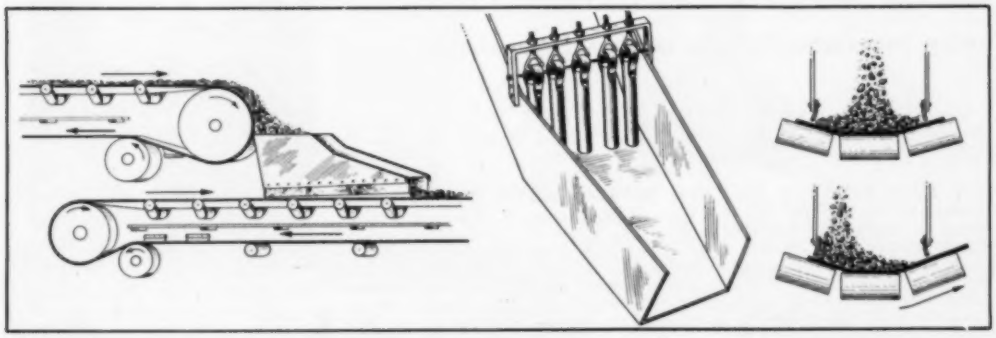
CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4299-M

# Plastic Guards First Aid Kits From Moisture and Pilfering

SEALING first-aid kits kept in working sections with Cocoon sprayable plastic served a twofold purpose at EG&FA's Wharton No. 1 mine, Wharton, Boone County, W. Va., the Coal Div.'s *Safety News Letter* reports. After the usual trouble with moisture and decay of triangle and compress bandages, the sealing idea was tried. It worked better than anticipated though, for it not only stopped the decay but prevented pilfering of supplies. Formerly, an employee could remove some supplies and close the cover and the loss would not be noticed until the material would be needed. Now, to open the box, the Cocoon cover must be broken and the removal is quickly detected.

Every section has one of the first-aid kits, housed in a 10 x 13 x 13-in metal box and containing small first-aid materials except finger compresses and other items used daily. They are seldom used, but when broken open by the foreman, they are returned to the plant inspector who refills and reseals them. If opened properly, the kit can be resealed by using only the Cocoon liquid, without the compressor and spray. Cocoon plastic spray (*Coal Age*, March and April, 1951) is being used at various company mines to seal stoppings and make quick efficient brattice seals.



**CORRECT LOADING SETUP**—Drop from belt to belt is at a minimum. Sufficient idlers around chute prevent belt "spanking" or "chattering." Skirt boards of flexible material are long enough to settle load.

**TO SLOW DOWN** large chunks where gradual chute is impossible, use metal or wood bars anchored at top.

**LOADING CORRECTLY** on center of belt (top), contrasted with result when loading is offside (bottom).

# How To Load Belt Conveyors

**THE INVESTMENT: Proper Care for Belting**
**THE DIVIDENDS: Longer Belt Life, Lower Maintenance Costs**

IMPROPER LOADING, is the No. 1 bug-a-boo in conveyor-belt operation, says Newell Perry, belting engineer, Thermoid Co., Trenton, N. J., after completing a study of the factors contributing to belt deterioration. Since the loading point is such a critical zone, both existing and proposed installations should be set up to create ideal loading conditions, Mr. Perry points out, in suggesting some precautions as follows:

1. Loading material should discharge to the belt at the same speed and in the same direction as those of the belt. Where this requirement is not satisfied, excessive wear results because of abrasion at the loading point.

2. Lumpy material should be cushioned by a prelaid layer of fines. A screen or grizzly at the bottom of the loading chute, or an oval or "fishtail" notch in the lip of the chute, will satisfactorily deposit a layer of fines over the belting, thus providing protection against bruising. Also, the velocity of the material being loaded may be controlled by adjusting the pitch of the loading chute and by keeping the fall distance between the chute and the belt to a minimum.

3. Chute discharge should strike the belt between closely spaced carrier pulleys or, where heavy material is encountered, directly over rubber-covered or pneumatic idlers. In no instance should material strike the belt directly above a solid pulley because the resulting hammer-and-anvil action will quickly damage the belt. In some instances, however, the impact of the load between idlers may set up belt vibrations which will permit material to escape under the skirt boards. This may be prevented by locating the chute so that loading material will strike the belt far enough ahead of the tail pulley to permit insertion of at least one belt-steadying carrier pulley. Also, carrier pulleys should be more closely spaced around the loading zone because of the higher impact loads.

4. Chutes and skirts should be properly built to settle the load on the belt without spillage or jamming. Skirt boards should be long enough to settle the material before it leaves the loading area. Flexible skirts made of pieces of belting should be installed so that the rubber-covered edge contacts the surface of the belt. If the exposed-fabric edge of the belt remnant is placed against the moving belt, grit will collect in the fabric and the resulting abrasion will wear a track through the belt cover. Vertical spacing between skirt-boards and belt should increase toward the open end of the chute. Thus, the width of flexible skirts, as cut from a belt remnant, should increase toward one end. This construction permits uniform contact between flexible skirt and belt over the entire length of the skirt and minimizes spillage around the loading point. At the same time, wedged-in lumps will be worked free by the forward motion of the belt.

# Foremen's Forum

## Practical Safety Incentives

**The Union Pacific Coal Co. consistently ranks high on the list of coal companies noted for sterling safety performance. Union Pacific's safety engineer tells you what his company *thinks* about safety and, more important, what his company *does* about it.**

By F. J. PETERNELL, Safety Engineer
Union Pacific Coal Co., Rock Springs, Wyo.

MR. PETERNELL: "Each supervisor is a safety instructor . . ."

TOP MANAGEMENT of the Union Pacific Coal Co. believes that it must accept its responsibility for safety, and that if safety is to be effective it must reach every corner of the property, be evident at all company meetings and, above all, be so instilled in all supervisors that they will set excellent safety examples for their men.

### THE FIRM FOUNDATION

Two common words, employee and management, are frequently misapplied, the great mistake being that the words have come to possess the idea that class naturally is hostile to class. The idea is completely false because both so-called "employees" and "management" all are employees of the company, though their functions may differ. This is the first obstacle to be overcome in building a safety program. Many times it is difficult to dispel the philosophy that a new safety idea is inimical to the interests of a particular group. Safety must be paramount to the interests of any group if safer mining is to be based upon a firm foundation.

The prime fundamental for sound safety promotion is a genuine desire for safety, which Union Pacific possesses. Since it is responsible for the success of a safety program, management must fulfill a triple obligation, as follows:

1. The conditions under which employees must work should be made as safe as present-day methods will permit.
2. All employees must be educated and sold by management on the principles of safety to make them safety conscious.
3. Duty to the company demands that plant and equipment be used and operated free of danger and damage.

### TRADING SAFETY IDEAS

Turning to specific ideas for increasing safety, supervisors are kept abreast of safety developments and management policy at weekly staff meetings of superintendents and foremen, also attended by at least one of the general officers. During the hourly session, open discussion is held on inspection reports, accident reports, production problems and so on.

To facilitate joint worker-supervisor activity on our properties, each supervisor is considered to be a safety instructor, and he functions as such. In the average case, eight men are assigned to each supervisor, and this close contact between supervisor and employee has proved its value by obtaining maximum results.

The company's Book of Standards and Book of Rules are the basis upon which workers and supervisors build a sound safety program. Sound standards and rules spring from experience and knowledge. They are not intended to cover every conceivable situation nor to take the place of common sense and good judgment. The job is left largely to supervisors and employees with the objective that safety be the first consideration. This policy is followed because experience indicates that keeping the program informal, permitting the men to use their initiative and ingenuity and keeping interest high by varying the program are more conducive to good results than are rigid regulations.

A key factor in any safety program is a continuous working-hour inspection of all company facilities, which in our operations is done by inspectors from the safety department accompanied by mine or surface supervisors. Violations of the company's Code of Standards, state mining laws or the federal safety code are corrected on the scene and a written report is sent to the general manager, who reviews the report and recommends corrective action to the supervisor. This method insures "follow

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

### *Luke Warm Says*

**Speak well of your enemies—you make 'em!**

**A dime is a dollar with taxes removed.**

**Two noises that always make a man's head turn — the rattle of money and the rustle of a petticoat.**

**There will be no raise in the wages of sin this year.**

**One good way for a gal to be spic is to have less span.**

**An expert is an ordinary guy who's a long way from home.**

***Hot Stuff*, Cortright Coal Co.**

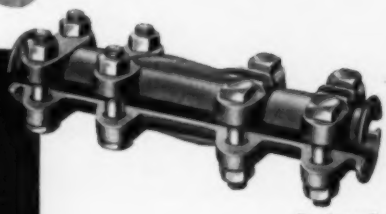
★ ★ ★ ★ ★ ★ ★ ★ ★ ★

# READY NOW!

Combination feeder and trolley wire clamp

Feeder suspension

Feeder sling



Feeder splicing clamp

## ELRECO FITTINGS

for large-diameter
ALUMINUM FEEDER

Fittings especially designed to accommodate bare aluminum mine feeder are available now!

The complete line of Elreco fittings can be used for bare aluminum up to 1,590,000 CM (equivalent to 1,000,000 CM copper).

Elreco also manufactures other combination clamps for use in low roof operations, quick-break switches, strain clamps and many more fittings suitable for aluminum conductor.

Write today for price and delivery information on the fittings you need. Tell us your copper sizes . . . we'll translate into aluminum equivalents. Address me personally c/o Elreco, 2901 Cormany Ave., Cincinnati 25, Ohio.

PRESIDENT

**Serving the Mining Industry Since 1892.**

THE ELRECO CORPORATION

A COMPLETE LINE OF TROLLEY MATERIAL FOR EVERY MINE.

## The foreman is a "big gun" in Union Pacific's war against accidents . . .

The FACE FOREMAN
MECHANIC-? HURRY LOADING MACHINE BEING TOWED—
MINE MECHANIX
FIX IT IN A JIFFY— HE SAYS—
1 HOUR
GOSH HE SAID TEN MINUTES
1 HR. LATER
MECHANIC
H-P KAY AT LAST!
GANGWAY!
1 MORE HR. or TWO
SORRY BUT CAN'T FIX— HAVE TO SEND TO FACTORY FOR NEW PART

through" on all matters of an irregular nature which might result in injury to an employee.

### TRAINING AND INCENTIVES

First-aid training, given to all employees at regular intervals by company instructors under the sponsorship of the Bureau of Mines, is required as a condition of employment. The training is imperative because (a) the men must depend upon each other for competent treatment until the aid of a physician can be obtained and (b) it promotes safety consciousness.

In view of the continuing trend toward mechanization, our supervisors receive mechanical training in company-planned courses and safety training in the Bureau of Mines' 40-hr course for officials. Technical papers from various meetings are distributed to supervisors to help them keep up with rapidly changing conditions, and all supervisors are encouraged to subscribe to at least one coal mining publication which deals with both safety and efficiency.

From the employee's point of view, our monthly and semi-annual safety meetings are attractive features of the safety program. In each of our company's six districts, a drawing for prizes is conducted at each monthly safety meeting. The prizes total up to $50 worth of merchandise if the district has suffered a lost-time accident within that month, but if there are no lost-time injuries, other cash awards are added. If there are not lost-time accidents for two consecutive months, the men of the district draw for a suit of clothes, which is offered every month thereafter until a lost-time accident occurs.

The monthly meetings last about an hour, and the program includes an educational 20-min sound film, remarks by the safety engineer and other staff officers and, sometimes, speakers from other industries, thus providing a varied program.

At the semi-annual meetings in February and August all employees who have worked during the 6-mo qualifying period without a lost-time injury are eligible to draw for a valuable prize such as a refrigerator, radio, freezer and so on, with one prize for each district. The proceedings are held in the Old Timers' Building in Rock Springs and are broadcast to the public and to meeting halls in all six districts. The semi-annual affairs are more than mere prize drawings because safety messages can be presented by Union Pacific officials and prominent outside speakers are invited to carry the safety theme forward under conditions most conducive to good reception, relaxation and good humor. This is one method of transforming our safety potential into kinetic energy.

### SAFETY SOCIETY

A Greek-letter safety society, founded in 1941 with 43 charter members and now having 138 active members, is a Union Pacific club restricted in membership to those supervisors "who have attained a commendable standard of safety in the conduct of their work." Those eligible for membership and the qualifications are:

Superintendents at mines that have won the Sentinels of Safety Trophy.

Mine foremen in charge of operations that have won the Sentinels of Safety Trophy or that have completed a calendar year without a lost-time injury.

Unit foremen and outside foremen who have conducted operations for three consecutive calendar years without a lost-time injury to men in their charge.

Only unit foremen and outside foremen are eligible to vote and hold office. General company officers are not eligible for membership.

The major contributions of the society are made through committees on safe practices. Ten such committees function in the following fields:

Roof and rib falls and timbering.

Haulage.

Handling and use of explosives.

Handling and storage of material inside.

Ventilation and rock-dusting.

Electrical and mechanical installations.

Proper operation and maintenance of tools and machinery.

Handling and storage of materials outside.

Prevention of injuries from slipping and falls of persons.

General welfare, inside and outside.

Each committee keeps continuous watch over its phase of the operations. All accidents are reviewed and discussed, and when all evidence is in the committee makes the necessary recommendations to the vice president in charge of operations who eliminates the hazard. The vice president reviews the recommendations with the general manager, general superintendent and safety engineer, and sends a copy of the committee's report to the president for his comment and suggestions.

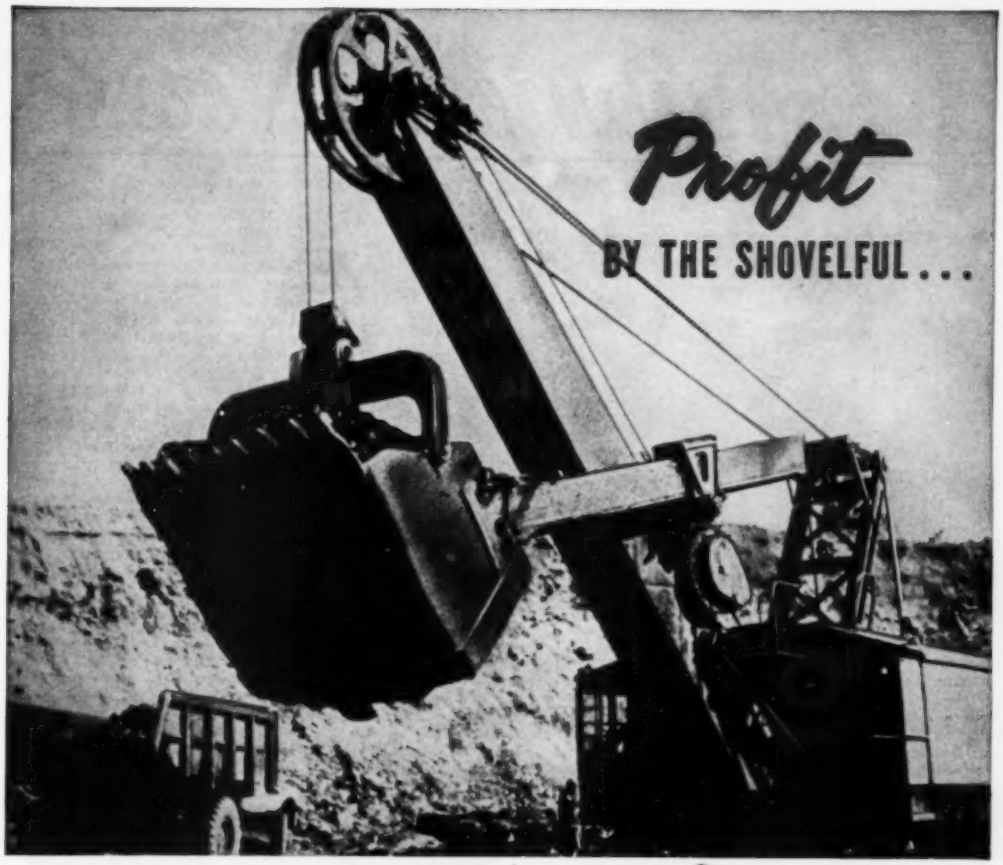
★ ★ ★ ★ ★

### *Really Right*

**"My interest is in the future, because I am going to spend the rest of my life there."**

***Charles F. Kettering***

★ ★ ★ ★ ★




## when you use AMERICAN CYANAMID COMPANY EXPLOSIVES

The shovel man and the shooters are all good friends on any job that uses American Explosives. These dependable explosives make it easy for the shooters to get just the right breakage required—the overburden has been readily removed, giving the shovel a clear "shot" at the coal.

American Explosives—the products of careful research and testing—come in a variety of densities and velocities. They are available from any one of several conveniently located plants and distributing magazines . . . *make your next order American.*

*Capable Field Engineers are Available at Your Call*

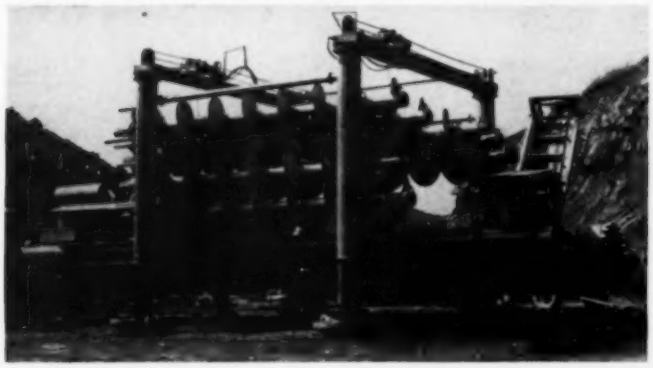
**High Explosives • Permissibles • Blasting Powder • Blasting Accessories**

AMERICAN *Cyanamid* COMPANY
*Explosives Department*
30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

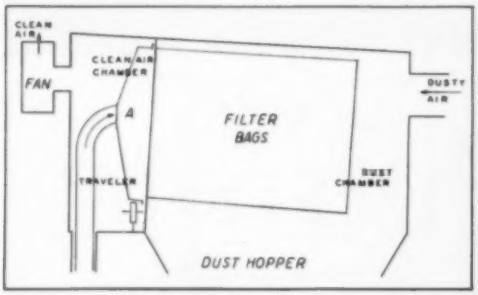
Sales Offices: Pittsburgh, Pa., Bluefield, W. Va., Scranton, Pa.
Chicago, Ill., Pottsville, Pa., Maynard, Mass.

# Equipment News

## New 42-In Coal Auger Produces up to 100 Tph (1)



Latest of the Compton coal augers, the new Model 42 announced last month by the Grafton Coal Co. permits high-wall drilling of 28- to 48-in diameter holes to produce 50 to 100 tph, depending on auger size, without removal of overburden. Outstanding improvements over the previous machine cited by the maker are: (1) shorter frame and shorter auger lengths providing decreased weight and lower price, greater ease and flexibility of movement, and better adaptability to most open pits; and (2) a newly developed cutter-head that permits much faster penetration, resulting in greater output and lower power consumption per ton of coal recovered. Frame of the unit is 42½ ft long, approximately 20 ft wide and 14½ ft high. The 22-ft-long auger sections have an effective drilling length of 21 ft and range from 24 to 42 in in diameter to drill 24- to 48-in holes. The high-speed cutter-head is 7 ft long, with 30-in-pitch double flights, and uses Kennametal bits. The operating carriage is powered by a 225-hp Model NHRS-600 Cummins diesel, with a Twin-Disc fluid-type coupling. The feed mechanism consists of a power takeoff driving a Vikers hydraulic variable pump and oil motor operating a traction drum along a stretched wire rope. A 54-hp Hercules gasoline-engine auxiliary power unit drives hydraulic pumps to operate overhead hydraulic Tulsa winches, the drag flight conveyor, jack-leg hydraulic cylinders and pilot pan. Present price of the Model 42, including nine 42-in auger sections, is $73,717.00. Circle No. 1 on return card facing P. 124 for bulletin and details from *the Grafton Coal Co., Mfg. Div., P. O. Box 1946, Clarksburg, W. Va.*




## Dust Filter Maintains Uniform Suction With Continuous Filter Cleaning (2)

New Sly Dynaclone now available for a wide variety of dust-collecting applications is a cloth-type filter offering uniformly maintained suction and removal of dust from filter bags by reversing the air flow. A traveling device moving across the open end of the filter bags has an air tube to the atmosphere so that the suction in the housing maintained by the system's fan results in air entering the traveling device and flowing through one bag at a time in reverse direction, thus causing dust on the outside of the filter bag to loosen and drop off. Constant cleaning of all filter bags assures uniform suction at the dust sources, eliminates shaking and flexing of bags and provides longer service from the bags, it is said. Circle 2 on the postage-free card for Bulletin 101 from *The W. W. Sly Mfg. Co., Cleveland 2.*

## New Flexible and Rigid Plastic Pipe (3)

Newly developed flexible and rigid plastic pipe for various piping needs, known as Plastex corrosionproof pipe, features positive resistance to rust, rot and electrolytic corrosion and a smooth interior surface that provides maximum transmission to deliver up to 40% more liquid than ordinary pipe, the maker says. It is extremely light in weight, about one-tenth that of equivalent metal pipe, and can be quickly installed above or below ground without tools, with connections easily made with cemented plastic fittings, it is reported. Plastex pipe is available in standard pipe sizes from ½ to 6 in, with coils made up to 400 ft long and straight lengths 25 ft long. Circle 3 on the postage-free card for Bulletin G-100 from *Plastex Pipe & Extrusion Co., Columbus 3, Ohio.*

## Angular Slotted Bits Drill Longer in Hard Roof

An angular slotted recess in the cutting edge of Kennametal Roof Drill Bits is a new design feature that greatly increases bit life, particularly in hard roof. It also reduces bit "wander". Operators have reported as much as 30 per cent longer footage in laminated sandstone with bits of the new design.

●

## "First Aid" to Ailing Drill

Whenever you have trouble with drilling or cutting, "just call your Kennametal representative." He's an expert on these matters—and must be. He devotes all his time to them, and is a veteran coal mining man to boot. When one operator in Central West Virginia had a few armatures burn out, he called Jason C. McGuire, our local representative. After giving conditions the once-over, it was obvious that the bits were not being properly reconditioned. They were losing gage, and not allowing sufficient clearance for the auger. The problem was solved in a short time by giving the bit grinding man the proper instructions for the particular drilling conditions that were being encountered down at the face. It was a small, but important matter. But frequently little changes can make an appreciable difference in operating cost. Always depend on your local Kennametal representative for matters like this. He's glad to be of service.

●

## Hexagonal Shank Bits for Drilling Holes for 2-5/16" Diameter Tubes

Kennametal Hexagonal Shanks in sizes of ⅜" and 1⅛" provide strong bit construction for drilling larger diameter blast holes. They also enable the bits to withstand heavier pressure when they are being used on large drills for drilling hard impurities.

●

## Jack W. Begley is New Kennametal Representative

Jack W. Begley has been recently appointed Kennametal sales representative for southern West Virginia, western Virginia, and eastern Tennessee. Mr. Begley has worked in and around coal mines since the age of 16 and he takes over this assignment 1½ years after being graduated in mining engineering from the University of Kentucky.

*(Advertisement)*


*Only*

**KENNAMETAL**

*offers you . . .*

- **LONGER LASTING CARBIDE**
- **SUPERIOR BIT DESIGN AND CONSTRUCTION**
- **EFFICIENT FIELD SERVICE**

*to Give You Better All-Around Bit Performance . . .*

Kennametal Carbide, bit design, and field service are a proved combination of features, offered only by Kennametal, that assure lowest coal cutting cost, at highest efficiency.

Kennametal Carbide possesses greater uniformity of grain structure which gives it maximum resistance to impact and wear. Evidence of this fact is that 95 per cent of the cutting and drilling in hard potash ore deposits is done with Kennametal. This is as severe a test of the stamina of a bit as exists. The design and construction of the Kennametal Bit itself is no less important. The bit body is a special alloy steel that is heat-treated and hardened to the extent that it has the highest strength obtainable in a 1"x ½" steel section. A shoulder on the bit gives the cutting edge extra support, and prevents the bit from freezing in the block. In addition, Kennametal Bits are offered in more than 30 different types of cutting edge construction. This affords opportunity to have a design best suited to your needs—cost, job, equipment considered.

These outstanding features of Kennametal are supplemented by competent Kennametal field representatives, veteran coal mining men, who are always available for demonstration or for service on any trouble that may develop. They give you the best, and they know the best, and they know carbide bits — inside out. Kennametal Inc., carbide bits — inside out. Kennametal Inc., Latrobe, Pa.

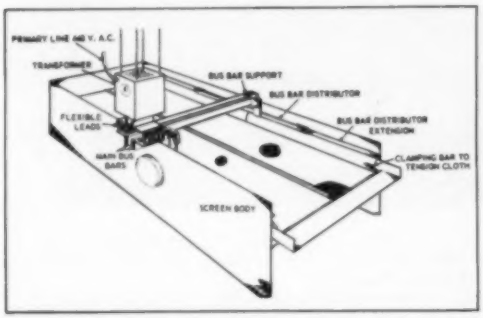
**KENNAMETAL.®**

**Quality Carbide Of The Coal Industry**

*World's Largest Manufacturer of Tungsten-Carbide Mining Tools*

## One Hand for Hydraulic Rail Bender (4)

By application of hydraulic power with this new lightweight West Virginia Steel & Mfg. unit, rail bending is no longer a back-breaking job, the maker reports. The bender is designed for 25- to 40-lb rail and will exert a pressure of 30 tons. Nominal pressure applied with one hand to the short operating lever will readily bend the heaviest rail in its capacity range. After bending is completed pressure is released by opening a release valve which permits the ram to return to its original position. The body and yoke are made of heat-treated aluminum alloy and the complete bender weighs only 45 lb. Folder from *West Virginia Steel & Mfg. Co., Huntington 6, W. Va.*




## Heat Unit Stops Blinding on Vibrators (5)

New Allis-Chalmers "Thermo-Deck" heating unit designed to eliminate blinding when screening fine moist materials is simple, economical and harmless to workers, the maker says. It uses the standard steel clamping bars on Allis-Chalmers screens as electrical conductors, with the current carried by pressure contact from bus bars through the clamping bars to the screen cloth to provide uniform heat distribution over the entire screen surface. Screens can be replaced without disturbing the electrical connections and no electrical auxiliary parts are in contact with the material being screened. Small air-cooled dry-type transformers especially designed to operate in dusty atmospheres furnished with Thermo-Deck units can be conveniently located on stationary supports adjacent to or suspended above the screen and are equipped with a tap-changing switch with four to six steps to obtain desired changes in voltage. Bulletin O7B7812 from *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

## New ¾-Yd Unit Offered in Four Fronts (6)

New American Hoist Model 375 BC ¾-yd crawler crane is available with choice of crane, shovel, dragline or pull-shovel fronts. Following the basic "American design" used on larger units, the 375 BC features a machinery platform that is an integral rolled-steel electrically welded unit rather than the conventional cast center with bolted-on walkways. A special lightweight alloy steel is used in the boom to eliminate dead weight and permit maximum pay loads. With the controlled lowering arrangement which is standard on the high-speed boom hoist, boom radius may be easily changed with perfect control and no danger of dropping the boom, the maker says. Full details from the *American Hoist & Derrick Co., St. Paul 1, Minn.*

## Loader Speeds Up Stockpile Loading (7)

New stockpile-windrow loader, the Athey Force-Feed Hi-Loader, features the Athey full-floating feeder designed to permit the paddle blades to "float" over the contours of the windrow and a new auger gather-feeder that speeds up loading from stockpiles and wide windrows, the maker reports. The 30-in conveyor belt is cleated to handle snow, sand and other light materials as well as heavier dirt and rock. Loading rates range up to 25 yd per minute in snow and 10 yd per minute in other materials. The swiveling discharge conveyor can be directed 45 deg from center. All operations are controlled hydraulically and the unit is powered by a Ford 95-hp engine, with travel speeds up to 19 mph and loading speeds ranging through four gears from 0.3 to 1.92 mph. Specifications from *Athey Products Corp., Chicago 38.*

## Sheet-Rubber Coating Cuts Abrasion (8)

Special rubber coating, known as "Linatex," is made from fresh rubber latex in sheets 1/32 to ½ in thick and can be easily cemented with a firm bond to metal, wood or concrete for protection of tanks, pumps, piping, belting and other machinery parts and structures, the maker reports. Easily cut and shaped, Linatex is nonabsorbent, is unusually resilient, offers high resistance to abrasion and withstands the corrosive action of most chemicals, it is said. Circle 8 on the postage-free card facing p 124 for bulletin offering full details of performance and application from *Linatex Corp. of America, Rockville, Conn.*

## Sectional Conveyors Highly Flexible (9)

Improved Transall line of sectional belt conveyors for underground use feature design flexibility and ready movability that make them adaptable and economical for various operating conditions, the maker says. The sections are chair-supported for easy mounting on the floor, ramps or crossties, and low-cost anchored foundations also are avail-

# Eaton 2-Speeds are designed and built to stay on the job

THESE EXCLUSIVE Eaton features are the reason why: planetary gearing distributes pressure and wear over a number of small gears, resulting in lower unit stress; forced-feed oiling system provides positive lubrication to all moving axle parts at even slowest vehicle speeds; extra heavy construction eliminates the possibility of distortion or misalignment under excessive loads. These three features add up to longer parts life, outstanding dependability, minimum time in the shop and low maintenance cost. Let your dealer explain how Eaton 2-Speeds will help your trucks haul more, faster, longer, at lower over-all cost.

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*2-Speed Truck*
**AXLES**

*Axle Division*
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

**PRODUCTS:** Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

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- Special Cranes
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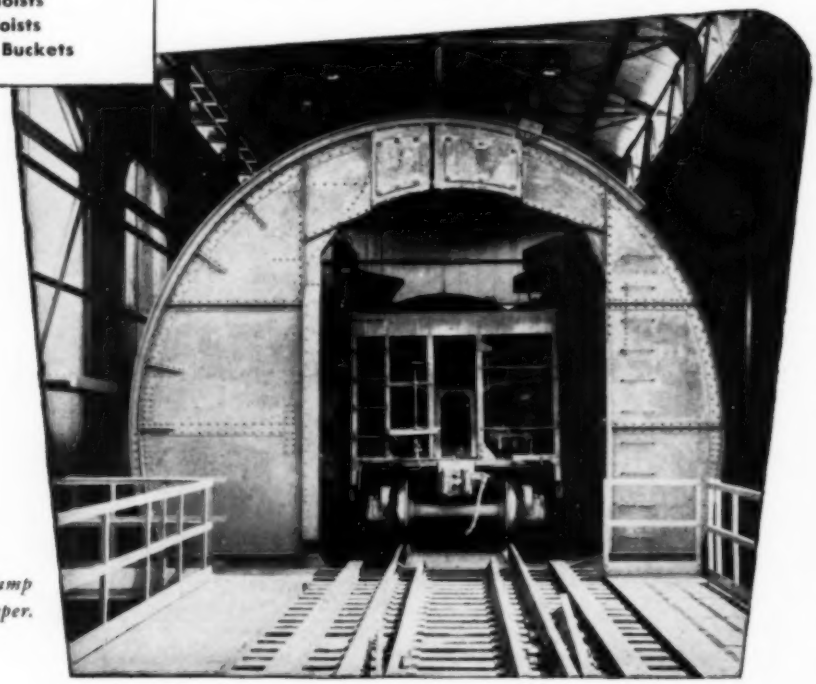
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Clamshell Buckets

# WELLMAN Car Dumpers

***Select the right dumper from the most complete line***



*Wellman 60' 4-clamp Revolving Car Dumper.*

• The complete line of Wellman Car Dumpers includes Lifting, Turnover, Traveling and Revolving Types. The Revolving Type is an example of Wellman's engineering skill. It is self-contained, requiring no external structures. A rack segment and pinion at each end of the frame turns each end equally, preventing distortion of the frame.

**THE WELLMAN ENGINEERING COMPANY**

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# Small Stripper finds the Answer

## Thompson Coal Company produces 300 yards per day with an International TD-18A stripping and conveyor loading.

Where one tractor has to do the whole job, International's easy handling and high work capacity make a real difference in daily production.

At the Thompson Coal Company, Matoaka, West Virginia, an International TD-18A handles all the tractor work alone.

Here's what Ray Thompson has to say about it:

"This TD-18A has more power than any other tractor its size I've ever used before. We strip overburden, clean around the shovel and feed coal to loading conveyor with it. It has let us step up production considerably. For a small stripper, it's the answer!"

Whether you strip, with a single tractor or a fleet, let your International Industrial Distributor show you how to get more work done per equipment dollar with International power. He has the facts and the figures on the job International "power that pays" can do for you.

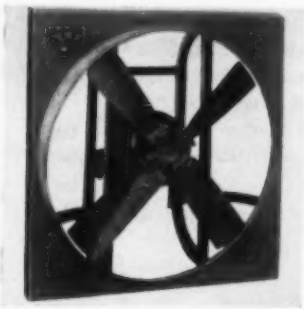
**INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS**

**ONE MAN GANG.** Thompson's steady-working International TD-18A is shown stock piling to prepare for conveyor loading of trucks. In addition, this handy tractor strips, makes roads and cleans loading area.

INTERNATIONAL HARVESTER

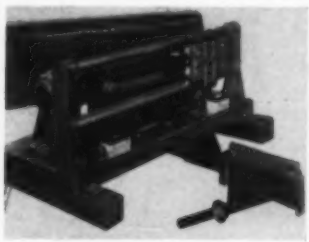
**POWER THAT PAYS**

able for long-distance overland installations. Sections are hinged at the mounting point to permit conformation to rolling or uneven terrain. All parts are interchangeable, and nest and stack compactly. The units are easily assembled and disassembled and the open-top construction (with idlers and deck plates removed) simplifies installation of the return flight, it is said. All sections are equipped with Transall heavy-duty prelubricated idlers, and terminal equipment is engineered to the job. Circle 9 on return card for Bulletin 202 from *Transall, Inc., Birmingham 4, Ala.*



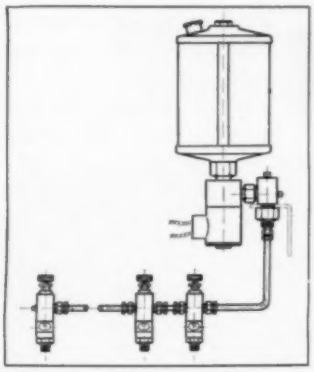
## Fan Line Equipped With Airfoil-Type Blades (10)

New Chelsea Type PLF "Power Line" exhaust and pressure fans are heavy duty direct-drive units designed for industrial applications, duct work, and mine exhaust and filtering units. They are equipped with non-overloading cast-aluminum airfoil-type blades. The units have totally enclosed ball-bearing motors and are available in sizes from 16 to 48 in delivering 2,900 to 37,000 cfm. They are said by the maker to be more economical than centrifugal-type fans on similar applications. Circle 10 on the return card for Catalog 400 and Bulletin 403-A from *Chelsea Fan & Blower Co., Plainfield, N. J.*



## Automatic Sampler for Wet or Dry Cuts (11)

Exclusive manufacturing and sales rights to the automatic sampler formerly known as the "Geco" sampler have been acquired by the Denver Equipment Co., which will market it as the "Denver Automatic Sampler." Designed to obtain accurate wet or dry sample cuts, the Denver unit now has a carriage assembly on ball-bearing rollers and a cutter actuated by a positive chain-and-sprocket drive for standard travel of either 16 or 21 in. The motor is shut off at the limit of cutter travel by a limit switch and is reactivated by a time switch according to the established sampling cycle. Cutter speed is fixed at 7½ in per second and the cutter can be operated off the set time cycle with the manual switch provided. Details from *Denver Equipment Co., Denver 17, Colo.*

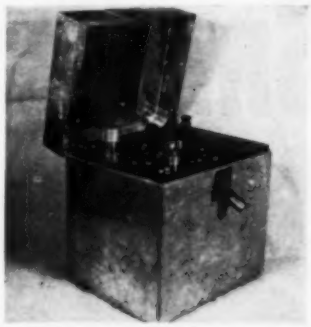


## Automatic Oiler System Stresses Simplicity (12)

Particularly applicable where points to be lubricated are far apart, new Oil-Rite Style DEI Electro oiling system is a fully automatic single-line gravity-feed system that simplifies piping because of the small quantity of tubing needed and is useful where space limitation is a problem, the maker says. It consists of a central reservoir with a solenoid-operated shut-off valve and up to 24 individual valves mounted directly into the bearings. Each sight-feed valve can be individually regulated and adjustments made and retained for proper drop feeding. The valves are made in three body sizes and can be used singly or gang-mounted. As the system is usually connected across the line of the driving motor, it oils bearings only when they revolve, it is pointed out. Bulletins available from *Oil-Rite Corp., Manitowoc, Wis.*

## Portable, Motor-Driven Gas-Cutting Unit (13)

The newly designed Airco No. 20 Radiagraph is the first machine of its type specifically built as a traveling carriage for mounting such equipment as the Aircomatic R machine and the Heliweld machine holder, in addition to serving as a portable motor-driven straight track-guided gas-cutting machine, the maker says. Designed for lasting service and low maintenance, the unit has a self-contained transmission and all controls are conveniently located for easy operation. Any speed within the operating range of 2 to 60 in per minute can be quickly and accurately set and maintained or changed during operation. Bulletin ADC 673 offered by *Air Reduction Sales Co., 60 E. 42 St., New York 17.*



## New Blasting Units for High Capacity (14)

Two newly designed portable condenser-discharge-type blasting machines, the duPont Models CD-45 and CD-30, have an unusually high capacity and will readily fire small tunnel rounds in straight parallel, sizeable rounds in straight series and a large number of caps in parallel-series, the maker reports. The number of caps fired is not dependent on the physical effort applied by the operator and the terminals are dead at all times except at the instant of firing, it is said. The terminals cannot be energized unless the operator has both hands on the controls and really intends to fire the blast. The compact units are encased in sturdy waterproof metal boxes and weigh 31 and 25 lb, respectively. They contain no moving parts. Full details from *E. I. duPont de Nemours & Co., Inc., Wilmington 98, Del.*

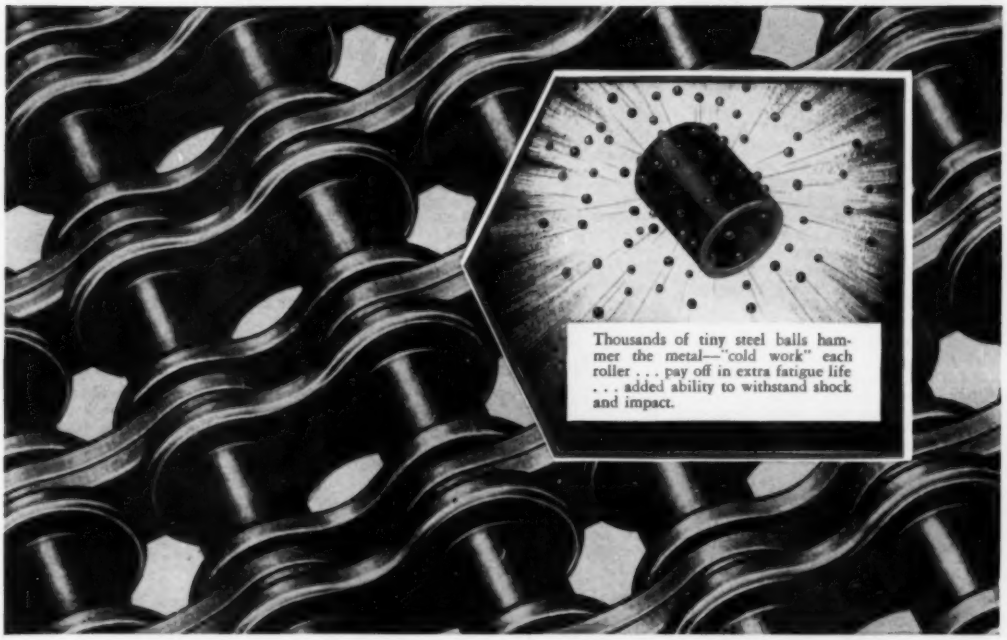
## Air-Powered Reversible Impact Wrench (15)

New Thor ⅜-in portable pneumatic reversible impact wrench features an exclusive rolling-ball-type cam which increases efficiency and steady functioning of the impact mechanism for exceptional power and long service life, the maker says. Equipped with convenient side handle and trigger-type throttle, the new wrench weighs only 5¾ lb and is 8$^{11}/_{16}$ in long. It has the reversing valve conveniently located at the back of the tool and is available with two types of spindles—Size 24 with ½-in square drive, and Size 24S with a $^{7}/_{16}$-in-hexagon quick-change chuck integral with the spindle. Full data from *Independent Pneumatic Tool Co., Aurora, Ill.*

**THE POSTAGE-FREE CARD**

**. . . facing p 124 will bring you more details on any item in this section without obligation. Just circle the numbers, fill out card and mail.**

# Get the roller chain that gives you SHOT-PEENED rollers...


Thousands of tiny steel balls hammer the metal—"cold work" each roller . . . pay off in extra fatigue life . . . added ability to withstand shock and impact.

# look for the darkened rollers!

THERE are sound reasons for the universal acceptance of Link-Belt Precision Steel Roller Chain. Two of them—shot-peened rollers and Lock-type Bushings—are shown here.

Others include Link-Belt's rigid material selection and controlled heat treating—your assurance of absolute uniformity with no weak members.

Whether it's for drive or conveyor service, you can get the best in roller chain from the complete Link-Belt line—single and multiple widths, in ⅜″ through 3″, and double pitch, 1″ through 3″. Next time you need roller chain, call the Link-Belt office near you.

**LINK-BELT**

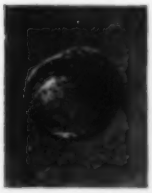
**PRECISION STEEL ROLLER CHAIN**

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,807

## Lock-type Bushings increase ability to withstand shock loads

A special manufacturing process securely locks the inside sidebars on the bushing, preventing lateral movement of the sidebars and eliminating a common cause of stiff chains. This Link-Belt development is applied on roller chains through 1″ pitch and double pitch roller chains through 2″ pitch.

## Equipment Shorts You'll Want to Check

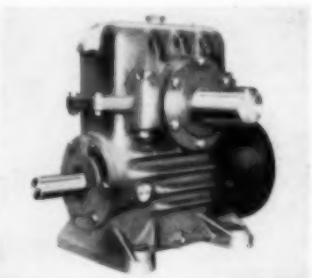


**(16) FOR STRIPPED OR WORN THREADED HOLES,** new Heli-Coil stainless-steel helical-wire thread inserts offer time and cost savings up to 80% in comparison with conventional methods of thread repair and, in addition, provide higher loading strengths and are more resistant to wear and corrosion than original threads, the maker says. Using the wire inserts requires only cleaning-out of the damaged thread, re-tapping the hole with Heli-Coil taps and placement of the wire insert in the re-threaded hole. Heli-Coil inserts are available for a wide range of tapped threads used in various types of machine castings. Circle 16 on the return card facing p 124 for data and sizes from *Heli-Coil Corp., Danbury, Conn.*

**(17) CONTINUOUS "V" PACKING**—New continuous chevron-type packing designed for 500-6,000 psi, available immediately for either high or low temperatures, is known as Flexrock "Continuous-Vee" packing and is furnished in sizes from ¼ to 1 in by $\frac{1}{16}$-in increments, 25 ft per spiral. Packing size is the only dimension needed in ordering "Continuous-Vee," as the user cuts his own rings on the job to fit specific rod and stuffing box dimensions, thus eliminating stocking a number of different sets of "V" packing. Further information from *Mechanical Packing Div., Flexrock Co., Philadelphia 4.*

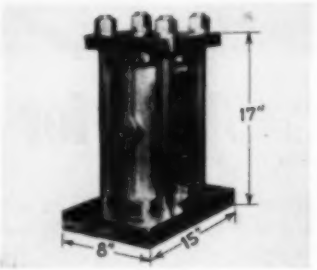
**(18) NEW INSULATING MATERIAL** offering unusual protection against heat and cold is known as "Celluliner" and is also used as a packaging and cushioning material to protect various delicate equipments. Here in photo, heat at about 2,000 F penetrates the material only slightly, it is said. By varying the manufacturing processes, Celluliner can be made either highly absorbent, or non-absorbent and moistureproof; can be mildew-proofed and flameproofed; is chemically neutral—*The Gilman Bros. Co., Gilman, Conn.*

**(19) NEW LABORATORY DRIER,** offering precise control of temperature and circulation, is a compact inexpensive portable unit operating on single-phase, 50-60 cycle, 110 or 220 v, AC. Features listed by the maker include an asbestos air-cell-insulated oven using a pair of standard easily replaced heating elements designed to keep the heat in the drier oven; low power consumption; thermostat control for precise adjustments between 0 and 325 deg F; and maintenance of proper humidity and drying conditions with a forced-air circulating damper. Full details from the *Denver Equipment Co., Denver 17, Colo.*



**(20) WORM REDUCTION GEARS**—New line of Crofts "Radiation" speed reducers offers a variety of ratios, ranging from 5:1 through 100:1 and from fractional up to 400 hp. The smaller units (1⅛-, 1¾- and 2¼-in diameters) feature universal mounting for worm on bottom, top or vertical installation. Ten sizes ranging from 3½ through 14 in are all fan cooled and are said to feature a combination of efficient operation, maximum power output and minimum case dimensions.—*National Transmission Distributors, Inc., 684 Broadway, New York, N. Y.*

**(21) GIANT-SIZE FOG NOZZLE** made especially to combat large fires in or out-of-doors, called the Bete Giant Model 500 fog nozzle, delivers a 500 gpm fog blanket with a large diameter of coverage and an effective reach of approximately 80 ft, the maker says. The tremendous cooling effect of this large volume of fog will almost instantly extinguish large flammable liquid fires, as well as wood, paint and other hot fires, it is said. Made with a 2½-in National Standard Thread connection, the new Bete nozzle has a patented spiral atomizing element without small orifices or internal parts that will pass small stones and other foreign matter freely through the nozzle without clogging.—Details from *Bete Fog Nozzle, Inc., Greenfield, Mass.*




**(22) FOR LARGE STORAGE BINS** with a capacity of 75 tons or more, new 5-in vibrator added to line of Cannon end-mounted "Quiet-Type" vibrators is said to be the largest end-mounted pneumatic vibrator made. The Cannon EM-5-QH vibrator weighs 180 lb and its 55-lb piston has a stroke of 1⅝ in with a maximum rate of 650 strokes per minute at an operating pressure of 80 psi. Air-cushioned operation eliminates metal-to-metal pounding for semi-noiseless operation, it is said. Details from *Cannon Vibrator Co., Cleveland 14.*

**(23) SAFETY AIR HOSE** for use on pneumatic equipment is designed to prevent accidents and possible fatalities caused by coming in contact with hidden power lines. Mercer's Invincible hose features specially engineered braided copper

# Practical Assistance

Whether it's getting out of a fishing tackle tangle, or unsnarling a *lubrication snag* in your mining operation...practical assistance, the kind that gets you off the hook fast, is the thing you look for most.

And ***PRACTICAL TECHNICAL ASSISTANCE*** is a Cities Service specialty.

Cities Service Lubrication Engineers can offer every mining operation practical assistance that will mean dollars, man-hours and equipment saved. These specialists in the industry's most effective lubricating practices, offer the most complete line of quality lubricants.

## *but check for yourself:*

✔ Check on the high quality of all Cities Service lubricants. Ask critical users, or better still, test them on the job.

✔ Check the *complete* Cities Service line for the correct lubricant for every need. Deliveries are quick, accurate and dependable.

✔ And finally, discuss your problems with a Cities Service Lubrication Engineer... he's probably solved many like them for other mining operations. Write or phone CITIES SERVICE OIL COMPANY, Dept. D9, Sixty Wall Tower, New York City 5 . . . or get in touch with the office nearest you.

**CITIES SERVICE**

# THE VICTAULIC METHOD OF PIPING

## EASIEST WAY TO MAKE ENDS MEET

TEES . . . ELBOWS . . . REDUCERS . . . the Victaulic Method features a complete line of modern, top efficiency, Full-Flow Fittings for use with world famous Victaulic Couplings!

The Victaulic Method assures a complete, modern system of piping . . . fast, efficient hook-ups that simplify and streamline construction . . . cut costs! Victaulic Couplings offer easy-to-install, leak-proof connections . . . a union at every joint . . . assured trouble-free service under pressure or vacuum. Victaulic Full-Flow Fittings specially designed for use with Victaulic Couplings provide wide adaptability and complete versatility in construction. And to make the Victaulic Method complete—"Vic-Groover" Tools groove standard pipe easily and quickly . . . provide handy, portable equipment for preparing pipe right on the job!

Try the VICTAULIC METHOD on your next piping job. New construction . . . repairs . . . alterations—you'll find that the Victaulic Method *is the easiest way to make ends meet!*

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**28th VICTAULIC YEAR**

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ribbon of 832 strands forming a high current-carrying medium which is securely bonded in the actual carcass of the oilproof, abrasion- and heat-resisting hose. In addition to its proven safety features, Invincible hose will considerably outlast ordinary air hose and is available in ⅝-in I.D. sizes, in 4- and 5-ply construction, the maker says.—*Mercer Rubber Corp., 66 Reade St., New York 7.*

(24) **ALTIMETER**—New FA-181 Sensitive Altimeter has been designed particularly to withstand the severest service in the field, with the altimeter mechanism supported by a shock mounting in a sturdy aluminum case with a latched metal lid. The unit employs the W&T mechanism featuring the self-balancing principle and custom calibration and has been specially designed to compute elevations directly from observations when using the two-base method. Data on the FA-181 Altimeter, the W&T Palmer Altirule and modern altimetry methods are available from *Wallace & Tiernan Products, Inc., Belleville 9, N. J.*

(25) **SPACE HEATER**—The Model HD direct-fired packaged unit heater is available in a range of sizes for outputs of 300,000 to 2,000,000 Btu per hour. The units are fully automatic, may be fired with any grade oil or gas or combination of both and may be mounted in any of five positions. Bulletin with full details from *Lee Corp., 1001 Tatnall St., Wilmington, Del.*

(26) **HIGH-ACCURACY TACHOMETERS**, with within ¼% of any speed being measured guaranteed by the maker, are suitable for motor tests, dynamometer test stands, laboratories and similar precision speed-measuring applications. Ac-

# New, Improved!

## Le Roi-CLEVELAND H166 Coal Drill

## FEATURES you want in a hand-held drill!

**Light Weight** — Weighs only 33 pounds.

**Low Air Consumption**— Permits higher working pressures at the drill, for better performance.

**Easy Handling** — Easy to hold and control. Rides a plank well, too.

**Strong Rotation** — Handles long steels easily — gives you faster drilling.

## —Plus the *RIGHT BLOW* for Hard Coal and the *extra power* you need for bony

This new coal drill with its outstanding performance can cut your costs. Available for ⅞" hex or quarter-octagon collared shanks 3¼" long. Write for full details today.

RD-43

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CLEVELAND ROCK DRILL DIVISION

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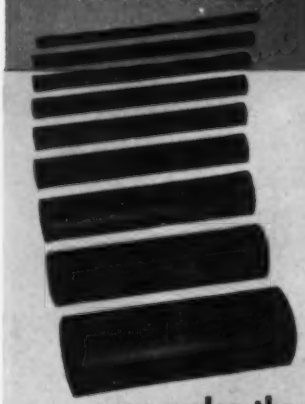
*Plants:* Milwaukee • Cleveland • Greenwich, Ohio

JOHNSONITE
PLASTIC PIPE
never corrodes



. . . even under the
WORST ACID CONDITIONS

Actual mine installations of Johnsonite Plastic Pipe prove its resistance to corrosion is many times greater than ordinary pipe.
Also, installation costs are lower because it handles so easily and the number of couplings have been reduced.

500 feet in the ½" size weighs only 50 lbs.

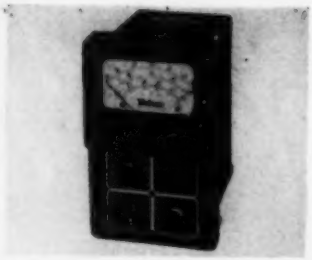
It finds its own floor—just lay it down

It's so flexible it can be tied in a knot

It can be cut with a knife

Johnsonite is tough. It lasts over 30 years.
*Write for our new catalog, or see your nearest distributor.*

JOHNSON PLASTIC
CORPORATION
BOX 268
CHAGRIN FALLS, OHIO



curacy is sustained, even under adverse external conditions, by simple calibration adjustments, and 10 overlapping and adjoining ranges instantly selected by a rotary switch provide more than a 10 to 1 spread in speed, the company says. Speeds of 36 to 100,000 rpm are easily covered by three models. Details from *Metron Instrument Co., Denver 9, Colo.*

**(27) VIBRATOR**—A new and larger vibrator added to the patented Peterson "Vibrolator" line, Model DV 51, is said to give an extremely powerful all-directional vibration that effectively moves materials without damage to large hoppers or bins. The new Vibrolator has only one moving part, is easily installed and requires practically no maintenance, the maker reports. It is instantly self-starting, quiet in operation and requires no lubrication.—Bulletin from the *Martin Engineering Co., Kewanee, Ill.*

**(28) FOR LARGE POWER CABLES,** a new oil-resistant tape for rapid insulation buildup on splices, designated "Scotch" brand electrical tape No. 23, is made of synthetic rubber that provides greater dielectric strength and resistance to high temperatures than natural rubber tapes, the maker says. The 40-mil thickness and extreme stretch (1,500% breaking point) makes possible smooth insulation wraps on irregular surfaces and, since it fuses to itself, it requires no adhesive. As the tape is not designed as a sole insulation, the maker recommends Scotch plastic electrical tape No. 33 as the outer wrap.—*Minnesota Mining and Mfg. Co., St. Paul 6, Minn.*

**(29) NEW ALL-PURPOSE ELECTRIC INSULATING VARNISH** developed by General Electric's Chemical Div. is suggested by the maker for use on a wide variety of electric equipment, including treating motor and generator cores and windings, magnet coils and transformer windings, and can be used on rotors with speeds up to 10,000 rpm. An oil-modified phenolic varnish, G-E 9700 cures thoroughly in deep sections giving high bonding strength with a smooth, wrinkle- and bubble-free surface, and may be applied by dipping, roller coating, brushing or spraying, and with vacuum or pressure impregnation.—*Chemical Div., General Electric Co., Pittsfield, Mass.*

**(30) COATING**—Carboline Phenoline 300 is a modified thermosetting phenolic resin developed for protecting structural and mechanical equipment against corrosion. It may be applied by brush, spray or trowel on steel, glass, wood, concrete, etc.; sets hard at room temperature; and resists solvents, alkalies and acids, it is said. Bulletin 600 with details from *Carboline Co., St. Louis 5, Mo.*

**(31) NEW INDUSTRIAL LUMINAIRE,** Westinghouse 2FPR-90, a streamlined version of a long standard design, is suitable for the operation of two T-17 mogul fluorescent lamps rated at 85, 90, or 100 w. New features cited by the maker include a rigid lampholder support; a snap-in chain mounting bracket which permits suspension from either one or two points; and indexed starters indicating the lamp operated. More information from *Westinghouse Electric Corp., Pittsburgh 30.*

**(32) DC ARC WELDERS**—New Model CA "Wasp" DC arc welders, available in 150- and 200-amp sizes, are said to be especially suited to DC straight polarity Heliwelding with Thor-Tung, with good operation at all current settings and continuous overlap from each current range to the next to provide a wide, unbroken range of welding current. The lightweight models provide easy portability when mounted on a two-wheeled carriage and require small floor space because of their compact construction, the maker reports. —*Air Reduction Sales Co., New York 17.*

**(33) FOR IMPORTANT SAVINGS** in reference time and increased clerical production in handling active records, including standard and special cards, binders and folders used in high-volume reference and posting operations, the Rotor-File consists of one or more circular tiers rotating on a vertical shaft with record material arranged in suitable trays or racks. The operator working from a seated position commands a large number of active records and can easily find any record in seconds by rotating the tier, the maker says. Details from *Wassell Organization, Inc., Westport, Conn.*

**(34) NEW MERCURY LAMP,** the General Electric A15, is said to be a highly efficient 1,000-w lamp for general industrial use where medium- or high-bay lighting is desired. Producing 52,000 lumens, the lamp is the most efficient of G.E.'s general lighting mercury lamps and has a life rating of 3,000 hr at five burning hours per start, and 4,000 hr at 10 burning hours per start. It operates satisfactorily in any burning position, on 440-480 v for highest efficiency.—*General Electric Co., Nela Park, Cleveland 12.*

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(35) IMPROVED LOCKNUT assuring a better lock when the nut is wrenched into position, the Security Locknut permits positive locking, exact nut adjustment and improved speed of application and can be used as a replacement for a standard non-locking type of nut, the maker says. Automatic locking of the nut on the bolt does not require bolt tension and the nut can be readjusted, removed and re-applied over and over again without losing its locking power and without injury to bolt threads, it is pointed out.—*Security Locknut Corp., Melrose Park, Ill.*

(36) GASOLINE - ENGINE - DRIVEN ARC WELDER, designed with the control panel conveniently mounted on the end of the unit, offers some 1,000 combinations of welding-current and open-circuit voltage, with 100 steps of fine adjustment provided in each of the 10 main ranges, the maker says. Auxiliary power at 110 v, 1-kw capacity, for powering lights and tools is available through a standard outlet receptacle on the control panel. The welder is available as a stationary unit or mounted on a four-wheeled pneumatic-tired trailer. Full data from *Hobart Bros., Troy, Ohio.*

(37) NEW HARDFACING ELECTRODES and acetylene welding rods, recently added to the Murex line, include rods for extreme abrasion, medium and heavy impact, severe shock, high red hardness, and extreme heat and corrosion resistance. In addition, there is a new Murex tungsten-carbide rod which provides an exceptionally slag-free deposit, permitting all residue to be readily cleaned away by wire brushing. Literature offered by *Metal & Thermit Corp., New York 17.*

(38) NEW BURETTE UNIT featuring a plastic reservoir which requires only a squeeze to fill as automatic self-leveling burette, the "Squeez-O-Matic" is said to be easy and simple to use, and requires only one hand, while older type automatic burette assemblies occupied both hands. The new burette units are available in 25 ml and 10 ml sizes graduated to tenths of a ml. Data from *Hagen Corp., 333 Fourth Ave., Pittsburgh.*

# EQUIPMENT BULLETINS AVAILABLE

(39) EIGHT METHODS OF BLASTING with millisecond delays are shown in a 20-p manual offered by the Atlas Powder Co., Wilmington, Del. Illustrating both progressive and alternate millisecond-delay techniques, the manual discusses principles of millisecond-delay blasting and offers diagrams of eight detonation patterns, photographs showing alternate and progressive blasts and sketches explaining why the Rockmaster "16" Blasting System offers better breakage, reduced vibration, reduced air blast, better toe action and minimized backbreak.

(40) SHOP AND FIELD APPLICATIONS of "Moly-sulfide" as an effective lubricant for a wide range of machinery and operating conditions are detailed in a new 40-p booklet issued by Climax Molybdenum Co., New York 36. Recommended applications explained in detail include prevention of galling and seizing of even softest metals; assembly and disassembly of close-fitting parts; hot and cold working and forming of metals; lubricants for high and low temperatures; non-dust-collecting and dielectric lubricants.

(41) ELECTRIC MOTORS—Design and application features of Life-Line motors (now made in ratings up to 700 hp) are described in a new 20-p Booklet B-4781 available from Westinghouse Electric Corp., Pittsburgh 30. Various Life-Line motor applications are illustrated and separate sections describe the special construction of motor frames, end brackets, stators, rotors and bearings, with standard and special mountings and enclosures also covered.

(42) RUST-PREVENTATIVE PAINTS—16-p Catalog 251 on Rust-Oleum rust-preventive coatings features the use of color chips throughout to illustrate exact colors. Detailed information and technical data complete with applications, resistance qualities, drying time, thinners and special applications are included for each. Available from Rust-Oleum Corp., Evanston, Ill.

(43) COAL-MINE MAINTENANCE WELDING is the title of a 16-p booklet illustrating and describing maintenance and repairs of a wide range of coal-mine machinery and equipment with Eutectic "Low-Temperature" welding alloys. In addition to techniques and materials used for specific equipment, the booklet includes a standardization chart of electrode applications and properties. Eutectic Welding Alloys Corp., Flushing 58, N. Y.

(44) EXPLOSIONPROOF, fan-cooled and non-ventilated Allis-Chalmers motors described in new Bulletin 51B7286A include the fan-cooled Type APZZ motors available in ratings of 3 to 100 hp and the non-ventilated Type APKK in ratings from 5 to 2 hp. Because of the elimination of enclosed external air passages, the motors are said to be easy to keep clean which, together with an efficient cooling system, makes them suitable for use where there is dust, dirt, fly ash, rain, snow, or corrosive gases. Bulletin from Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

(45) RECOMMENDED PROCEDURE for drilling long holes varying in depth from 20 to 150 ft with tungsten-carbide Rok-Bits, longhole drilling tools and standard percussion-type drills is fully covered in bulletin offered by the Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25. Such holes can be drilled in any type rock or ore in any direction, the manufacturer indicates, in two standard dimensions, 1¾ and 3 in.

(46) DUST COLLECTOR—Bulletin 914 on the newly announced Pangborn Type CM cloth-bag dust collector for fine dusts provides detailed information on the construction, operating and maintenance features of the unit, with data on standard sizes and dimensions. From Pangborn Corp., Hagerstown, Md.

(47) FOR MINE AND TUNNEL VEN-

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THE EDITOR, COAL AGE

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TILATION, Spiratube-M and Ayrtube are lightweight, flexible, easily coupled tubing described in Catalog C2-2 issued by Flexible Tubing Corp., Guilford, Conn. Included are full details of construction, design and specifications for Spiratube-M made in inside diameters of 3 to 30 in. and Ayrtube, a heavy-duty tube without a wire frame available in diameters of 5 to 36 in.

(48) MOTOR DRIVES—Pointing up the efficiency-improving, cost-reducing advantages of packaged all-electric adjustable-speed drives, Bulletin D-2311 presents a simplified non-technical explanation of the Reliance V*S Drive, its "economics," application versatility and operational flexibility in providing adjustable speeds from AC circuits. Briefly discussed are seven basic functions of this method of power transmission, available in drives of five types ranging from ½ to 200 hp. Reliance Electric & Engineering Co., Cleveland 10.

(49) ELECTRONIC SURGE COMPARISON TESTER, used mainly to locate insulation faults and winding dissymmetries in various electric apparatus, is completely described and both principles and methods of operation are presented in Bulletin DB-85-960 from Westinghouse Electric Corp., Pittsburgh 30. Detailed specifications of both models, the portable and mobile, are given, along with considerations and recommendations on their application.

(50) WIRE-ROPE ASSEMBLIES for machine parts and operating devices are covered in 24-p catalog called, "Macwhyte Safe-Lock Industrial Standards Wire Rope Assemblies." The booklet illustrates and gives detailed specifications for wire rope fittings permanently attached used for operating controls, as a part of machinery and equipment, and for slings and hoists. Industrial Standards Catalog 5201 available from Macwhyte Co., Kenosha, Wis.

(51) CARBIDE TOOLS—Newcomer line of standard and special cemented-tungsten carbides for machining steel, cast iron, nonferrous metals and non-metallics is described in Catalog 108, which provides complete information on standard blanks, standard tools, adjustable clamp tools, carbide milling data, cutting and grinding data, prices, etc. Available from distributor, Greenleaf Corp., Pittsburgh 21.

(52) BATTERY CHARGERS—Bulletin 10-210 describes and illustrates the full line of Type S single-circuit mg battery chargers for industrial batteries. Compact and completely self-contained, the chargers are said to require no manual attention during the charge. A simplified listing makes easy selection of the right charger for any popular-size truck battery. Available from Electric Products Co., Cleveland 12.

(53) VALVES—Bulletin covering the Fairbanks renewable composition disk bronze valves illustrates the different valves that comprise this group, assembled from the basic valve body and a few additional parts, and is complete with the specifications and the standard sizes of the various valves. Disks available in the Fairbanks renewable composition disk valves and a disk guide for their use is included. Offered by the Fairbanks Co., 393 Lafayette St., New York 3.

(54) COAL-HANDLING EQUIPMENT—Benefits of Clad-Steel design and construction in the reduction of corrosion, erosion and wear for a wide range of coal-handling equipment is discussed in detail in Bulletin 584 offered by the Lukens Steel Co., Coatesville, Pa.

(55) SLEEVE AND BOOT PROTECTION for various operating equipment is described in Bulletin AH-2 on Gerlite sleeves released by A&A Mfg. Co., 2017 Clybourn St., Milwaukee 3. Applications are listed for protectors as large as 24 in in diameter and 30 ft long, fabricated to order from special neoprene material impervious to flying chips, oil, grease and water. Common uses listed include sleeves for hydraulic piston rods, lead screws, safety protection over worm drives, gun-mounts, ways on machine tools, etc.

(56) BATTERY-WATER UNITS for conversion of ordinary tap water to pure mineral-free water for battery maintenance are covered in Bulletin B52 from A. E. Tompkins & Co., 1828 Columbia Rd., N.W., Washington 9, D. C. The booklet includes detailed specifications and performance data for both the standard and the heavy-duty Hydrion Units, with representative users and suggested application.

(57) MACHINERY PARTS—A wide variety of cast- and wrought-alloy parts now being used in many industries to solve abrasion, corrosion and high-temperature problems is described in a new 24-p booklet, "Long-Wearing Machinery Parts." Some 60 blueprints, tables and photographs show various sizes and shapes in which these Haynes alloy parts are being used. The booklet is available from Haynes Stellite Co., Div. of Carbide & Carbon Corp., New York 17.

(58) INDUSTRIAL WORK GLOVES described and illustrated in Catalog 52 now available from Richmond Glove Corp., Richmond, Ind., include 45 types of Bee Brand gloves, with all-leather, leather-palm, canton-flannel and jersey gloves featured. A leather-palm-glove selector simplifies ordering for a specific service.

(59) OILERS AND SUPPLY CANS—New Gem Catalog 100 contains complete descriptions, specifications and capacities of Gem's complete line of welded steel bench and pump oilers, supply cans, etc., for shops and other industrial users. Available from Gem Mfg. Corp., 1220 Goebel St., Pittsburgh 33.

(60) PRECISION INSTRUMENTS—Advanced-type slack-tube manometers, magnehelic gages, Visi-Flow air filter gages, hook gages and smoke gages engineered for utmost sensitivity and accuracy, highlighted in the new Dwyer catalog, are new additions to the company's line of portable and stationary gages for measuring positive or differential pressure, vacuum, velocity, flow or temperature of gases in laboratory, factory or field work. Copies may be obtained from F. W. Dwyer Mfg. Co., 317 S. Western Ave., Chicago 12.

(61) ESTIMATING BOOK, entitled "Estimating Production and Costs of Material Movement With Euclids," is offered in a revised and enlarged edition by the Euclid Road Machinery Co., Cleveland, 17. While intended primarily for use with Euclid earth-moving equipment, the methods and formulae can be applied to other makes as well. Included are job analysis and cost estimating data methods and various formulae and tables useful in estimating earth moving.

(62) FANS—Catalog 460 from the Chelsea Fan & Blower Co., Plainfield, N. J., offers prices, specifications, installation and performance data on some 30 fan types in over 300 sizes. Selection and installation data cover a wide range of fans for various industrial and commercial applications.

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**Reinforced with** Du Pont "Cordura," this belt (above) operates at 383 feet per minute up a 17-degree slope, delivering 525 tons of coal per hour. During its operation, it has never been necessary to stop it for attention or repairs; and the belt has not stretched enough to be noticeable.

**The slope belt** lifts the coal 281 feet vertically to the large, modern tipple of the Miners Coal Company. It is 948 feet between centers. In foreground is Manager Kenneth Snarr.

## Thinner belt reinforced with "Cordura" rayon trains better, loaded or empty

This 36" slope belt trains perfectly even when empty, according to Kenneth Snarr, Manager of Miners Coal Company, Madisonville, Ky. It was manufactured by the Manhattan Rubber Division of Raybestos-Manhattan, Inc., on a carcass made of Du Pont Cordura* High Tenacity Rayon.

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# NEWS Round-Up

## News Briefs and Trends

### USBM Refuses Power to Close Colorado Coal Mines

Legal power permitting federal inspectors to close any unsafe coal mine in Colorado, offered Feb. 21 by Tom Allen, Colorado chief coal mine inspector, has been refused by the USBM, it was reported several days later. According to reports J. H. East, USBM regional director, said that he had been notified by J. J. Forbes, USBM director, that federal inspectors are under executive order not to act as state mining law enforcement officers. Mr. Allen's action came after renewed criticism of the state agency by an official of the Colorado-New Mexico district of the UMWA. Pointing out that his department had only four inspectors to cover the entire state, Mr. Allen said that under state laws he was permitted to deputize federal inspectors to close any mine they consider dangerous.

### Ousted Official Sues UMWA; Arrests Follow Disclosures

Charles Minton, Norton, Va., former UMWA field representative, Feb. 28 filed a $350,000 damage suit against the UMWA and District 28 charging that he was fired "for economic reasons" soon after he refused to follow orders to murder two owners of the Gladeville Coal Co. He admitted that he and others had participated in the dynamiting of a substation owned by the company during the Wise County organizing drive last year. Following filing of the suit, Minton and five others were arrested on criminal charges growing out of the dynamiting. Those arrested included Allen Condra, District 28 acting president and other district officials. I. G. Stone, district vice president, and M. B. Bloomer, field representative, reportedly resigned their union positions shortly after their arrest. In his suit, Minton also charged that top-level orders came down to district heads to use "rough stuff" at non-union mines. Later, three of the coal companies affected by the violence reported in Minton's suit sued the UMWA and District 28 for a total of $500,000 in damages.

### TVA Coal Buying Hit

A Congressional investigation into the TVA's methods of awarding contracts for the purchase of coal was demanded by Rep. Howard H. Baker (R., Tenn.) in a formal statement issued last month. Earlier, representatives of the TVA had been called to Washington to testify before the House Appropriations Committee in a private hearing, following charges published by the Chicago *Tribune* that TVA had let contracts to "firms and individuals with no experience in coal mining." In his statement, Rep. Baker pointed out that the House Appropriations Committee had already "taken notice" of the situation and urged that the group continue the inquiry to a "final conclusion." Rep. Baker charged that in buying coal for its steam plants TVA "has ignored regular producers in the Tennessee-Kentucky area to award contracts to fly-by-night operators without assets, without coal and without performance bonds."

### Expense-Paid Trips for Winners Of EG&FA Foremen's Contest

A knowledge of safety rules and mining practices will pay off in a contest being conducted for underground foremen at the 21 mines of Eastern Gas & Fuel Associates Coal Div. Top man in each of the five groups of company mines will receive a 5-day all-expense trip to attend the annual meeting of the Mine Inspectors' Institute of America in Wilkes-Barre, Pa., to be held in June. The contest, conducted by the EG&FA Accident Prevention Department, headed by Joshua Smith, director of safety, consists of a series of questions published in the department's Safety News Letter. The five winners of a similar contest last year attended the Mine Inspectors' meeting in Lexington, Ky., at the company's expense.

### U. S. Coal to Canada to Rise

Bituminous coal shipments from the U. S. to Canada will increase 6 to 7% in 1952, to exceed 24 million tons, Appalachian Coals, Inc., predicted last month in a comprehensive study of Canadian market potentials. The forecast is based on the fact that Canada has found it more economical to import high-quality U. S. bituminous coal than to transport its own coal from mines in Newfoundland and the far north. Since World War II, Canada has been developing industries and natural resources to an extent undreamed of a decade ago, ACI reports. With most of the expansion taking place in Ontario and Quebec, the American bituminous industry stands to gain from the current Canadian boom, which in many phases is outstripping the United States.

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### UMWA Assessment Continues

The special assessment of $2 a month on UMWA members, originally announced last December for the first 3 mo of this year, is not to be discontinued March 31, it was reported last month. Levied by the union's International Executive Board "to create additional insurance by erecting financial bulwarks to take care of any emergency that we may meet in the future," the monthly assessment will continue in effect until the termination date of the present contract, it is understood.

### Coal Output Off Slightly

Bituminous and anthracite production for the year through the week of March 15 were 2.1 and 3.1%, respectively, below the output in the same period of 1951, according to USBM figures. Bituminous totaled 113,752,000 tons through March 15, 1952, as compared with 116,181,000 up to March 17, 1951. Anthracite output was 8,577,000 tons in 1952 period, as against 8,849,000 tons in 1951.

### Federal Mine Control Bill Approved By Senate Committee

The Neely bill empowering the USBM to close coal mines considered unsafe and providing fines and jail sentence for operators not obeying such an order was unanimously approved by the Senate Labor Committee Feb. 26. The committee's report followed hearings held in Washington the previous month (*Coal Age*, March, p 129), but there was no indication as to when the bill would come before the full Senate for a vote. Similar legislation is being considered by a House committee, which held hearings in February but had not released its recommendations by the latter part of March.

### Virginia Safety Study Set; Revised Code Killed

Methods to provide increased safety in Virginia coal mines will be studied by a seven-man commission created by the

# Weak-Kneed Should Leave Anthracite, Says P. & R. Head

"THAT GROUP who sees no future in anthracite, who feel that hard coal is now dead, should quickly withdraw into some other line of endeavor," says Edward G. Fox, president, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa. Mr. Fox spoke March 17 at the annual dinner meeting of the Ashland (Pa.) Chamber of Commerce.

The problems of the industry, "Whether they be large or small, cannot be solved by assuming a defensive position," he said. "Let us stop making excuses for anthracite. It is a product which does not need to be defended in any sense. Let us speak of the value and good qualities of our hard coal," he urged.

"The existence of non-union, wage-cutting, protected miners and shippers of substandard coal" is a serious threat, Mr. Fox warned. "This coal is being handled by unscrupulous brokers who have no regard for any safe mining conditions, payments of just debts or the welfare and future of the great anthracite industry," he said.

Citing details of "this glorified 'bootleg' business," Mr. Fox said that substandard coal with ash content of 25 to 30% adds up to about 10% of total anthracite production. Nearly all of it originates in the southern anthracite field, where it totals about 28% of production, he pointed out.

Producers of substandard "within-the-law" anthracite pay no taxes, make no contribution to the Health & Welfare Fund, pay no employment or social-security tax and operate from sunup to sundown, Mr. Fox said. Likewise, they make no contribution to advertising, research or other industry costs, he added.

Turning to labor relations in anthracite, Mr. Fox said that the Anthracite Board of Conciliation is chiefly responsible for the industry's "excellent" labor relations. With the exception of a few minor stoppages following contract expirations, there has been no general strike against the industry since 1925—a record unequalled by any other major industry in the country, he said.

"The UMWA, under capable leadership both local and national, are fully aware of and sympathetic to the problems of their industry and are cooperating to the fullest extent in their solution," Mr. Fox continued.

Besides joining Anthracite Institute in industry research and carrying on its own studies in fuel and non-fuel uses of anthracite, P & R is investigating new methods of mining and new types of mining machines, he said.

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General Assembly last month. The commission will report its findings by Oct. 1, 1953, according to a resolution passed March 7. Earlier on Feb. 27, a House committee had killed by a 10-2 vote a bill to establish an entirely new code for coal mining in Virginia. The new code, advocated by the UMWA, had been opposed by both small and large coal operators and by the head of state Department of Labor and Industry.

### No Violation in Mine Blast

There was no violation of the law or negligence involved in the Feb. 2 explosion in the Carpentertown No. 2 mine of the Carpentertown Coal & Coke Co., Greensburg, Pa., according to a report of a three-man commission composed of State Mine Inspectors George J. Steinheiser, Charles H. Curry and George S. Struble. The blast was caused by a "sudden liberation" of methane, which was ignited by an arc from an electric locomotive, the commission said. The mine reportedly resumed operations Feb. 29.

### Western Fuel Council Continues Fight on Canadian Natural Gas

More than 150 representatives of industry, labor and the public joined in opposing import into the U. S. of Canadian natural gas at a meeting of the Western States Policy Fuel Council held in Salt Lake City recently. The council, which is composed of representatives of coal operators, UMWA, railway unions, coal marketing associations and others, adopted three resolutions condemning the applications of four companies now pending before the FPC. The council started its fight against the import of Canadian gas last fall. At the meeting, B. P. Manley, executive secretary of the Utah Coal Operators' Association, was elected president of the Council. Roscoe C. Lots, chairman and Montana state representative, Brotherhood of Railroad Trainmen, was re-elected vice president, and R. J. Boyle, secretary-treasurer, District 27, UMWA, was re-elected secretary-treasurer of the organization.

### Coal-Company Earnings

**Pittsburgh Consolidation Coal Co.** reports a consolidated net income (exclusive of profit on disposal of property, investments, etc.) of $16,045,000 or $7.44 per share for the year 1951. This compares with $16,145,000, or $7.49 per share, in 1950.

**Glen Alden Coal Co.** in 1951 earned $673,146, net income, or 39c per share, compared with $2,228,617, or $1.28 per share, in 1950.

**Lehigh Coal & Navigation Co.** had net earnings of $1,646,820, or 85c per share, in 1951, as against $2,626,545 or $1.36 per share in 1950.

**Truax-Traer Coal Co.** for 3 mo ending Jan. 31, 1952, reports net earnings of $1,386,811 or $1.20 per share on sales of $17,985,441. For the same period a year ago, net earnings were $1,243,755 or $1.13 per share on sales of $16,612,329.

**Peabody Coal Co.** reports net earnings for the third quarter of the company's fiscal year (quarter ending Jan. 31, 1952) as $650,938, after federal income taxes, compared with $911,043 for the corresponding quarter a year ago. Per-share earnings in the latest report were 57c as against 89c the year before.

**Independent Coal & Coke Co.** reported a profit of $174,701 for 1951 against $98,018 in 1950.

**Lehigh Valley Coal Corp.** and subsidiaries—For 1951: Net income of $347,834 ($1.56 per first preferred share) on sales of $33,244,408. For 1950; Net income of $231,633 ($1.04 per share) on sales of $32,525,426.

**West Virginia Coal & Coke Corp.** reports unaudited consolidated net earnings of $1,134,176 for 1951, after all charges and taxes, equal to $2.27 a share on 500,000 shares presently outstanding, compared with $1,638,840, or $3.90 per share on 420,000 shares in 1950.

**West Kentucky Coal Co.** in 1951 had net income of $2,916,814 ($3.40 a share) compared with $3,270,919 or $3.82 per share in 1950.

**More News Briefs on p. 154.**

## Safety Milestones

**Galloway No. 3 mine of the Simpson Creek Collieries Co., Inc., Galloway, W. Va., recently was congratulated by the West Virginia Department of Mines for mining 1,473,146 tons, up to Jan. 1, 1952, without a fatal accident**

**The Hudson Coal Co. was scheduled to hold March 15 its 14th annual dinner honoring its "Safety Key Men." Some 300 company officials, state and federal officials were expected to attend, in honor of the 74 active and 25 inactive members of the group.**

**The Stearns Coal & Lumber Co., Stearns, Ky., recently cited in the local newspaper 81 of its miner employees who had worked for the company 20 yr or more without a lost-time accident.**

# Another case where JOY SULMET BITS beat them all!

Clark Coal Company
PRODUCERS AND SHIPPERS
Marion County Low Sulphur Gas Coal
47 WEST END DRIVE
Fairmont, West Virginia

Joy Manufacturing Company
Henry W. Oliver Building
Pittsburgh 22, Pa.

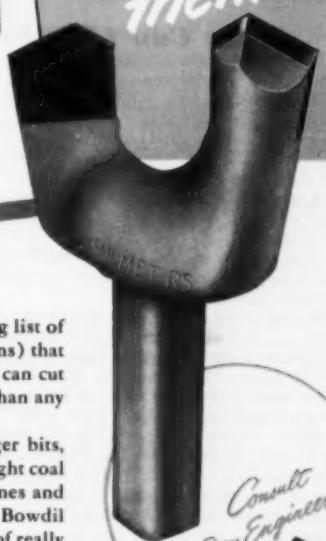
Gentlemen:

We use hand-held electric drills in our mine. Drilling conditions are good, only an occasional streak of sulphur and very few clay veins. We use a 1-7/8" bit.

Before we standardized on Joy Sulmet auger bits, we used steel bits exclusively. We have tested many other makes of tungsten-carbide bits, but none of them gave us a cost as low as the $.0035 per ton we got with steel bits.

With Sulmet bits, however, our costs are only $.0028 per ton. We have therefore replaced the steel bits throughout our mine with Joy Sulmet auger bits, since no other bit has ever given us so low a drilling cost.

Very truly yours,
CLARK COAL COMPANY
Frank Clark, Supt.
Frank Clark, Supt.



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One more instance is added to the long list of proof (in *all* fields, under *all* conditions) that JOY SULMET Tungsten Carbide Bits can cut faster and at less cost per ton of coal than any other bit on the market!

Joy Sulmet Bits are available as auger bits, finger bits, and cutter bits. There are eight coal cutter bit styles—for all cutting machines and conditions—including a design for the Bowdil ML Chain. ● Give yourself the benefit of really fast cutting, long bit life, and lower bit costs per ton. *Joy Sulmet Bits will do it!*

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# Personal Notes

**George W. McCaa,** formerly general superintendent, Consolidation Coal Co. (W. Va.), Fairmont, W. Va., has joined the Jamison Coal & Coke Co. as general manager of operations, with headquarters in Greensburg, Pa. **George Judy,** formerly superintendent of Consol's Williams mine, has been named to succeed Mr. McCaa.

**William F. Diamond** has been named chief engineer, Island Creek Coal Co., Holden, W. Va. Mr. Diamond has been succeeded as manager of the Kentucky-Elkhorn Div. of the Pond Creek Pocahontas Co. by **David E. Bayer,** manager, Marianna Smokeless Coal Co., another Island Creek subsidiary, Marianna, W. Va. **William Belano,** superintendent, Penowa Coal Co., Burgettstown, Pa., has succeeded Mr. Bayer at Marianna.

**M. M. McCormick** has joined the Franklin County Coal Corp., Royalton, Ill., as general superintendent, succeeding **A. L. Roberts,** who announced his resignation early this year. Mr. McCormick formerly was associated with Consolidation Coal Co. (Ky.). Mr. Roberts, who had been with Franklin County for the past 6 yr, reported that his only immediate plans called for relaxation at his farm near Benton.

Peabody Coal Co. has announced several changes in supervisory personnel. **Richard M. Griffith,** superintendent of Mine No. 47 for many years and more recently superintendent of Mine No. 43, has been transferred to Mine No. 40 in a similar capacity, succeeding **John Williamson,** recently transferred to superintendent, Mine No. 17. **Glenn Dodd,** recently mine manager at Mine No. 14 and for some years in the same post at Mine No. 47, has been advanced to superintendent, Mine No. 43, replacing Mr. Griffith. **Robert McPhail,** mine manager, Mine No. 59, has been transferred to Mine No. 14, in a similar position. **William Whyte,** formerly shop foreman at Mine No. 40, has been promoted to chief electrician of the company's Southern Illinois Div. At the company's Ameagle (W. Va.) No. 70 mine, **Leyman Friend,** with the organization for 24 yr, has been appointed chief clerk.

**David Roberts Jr.,** president of the Brilliant Coal Co., Birmingham, Ala., since the death of his father in 1909, has been elected chairman of the board. Succeeding him as president is his son, **David Roberts III,** who joined the company in 1936 as mining engineer and formerly was general manager.

**John E. Merryman** has been appointed safety engineer, Willow Grove No. 10 mine of the Hanna Coal Co., succeeding **J. S. Mathews,** resigned. Mr. Merryman, who has been with the company for 19 yr, formerly was assistant master mechanic at Willow Grove.

**Ed Riddle,** tipple foreman at the Wyoming Mine of the Red Jacket Coal Corp. since opening of the operation, has retired. Mr. Riddle had been associated with the W. M. Ritter Lumber Co. and the Red Jacket Coal Corp. for more than 50 yr.

**Russell D. Squibb** has joined the West Virginia Coal & Coke Corp. as industrial engineer, with headquarters in Omar, W. Va. Before joining the company, Mr. Squibb was general manager of Truax-Traer's eastern division for 2 yr and previously was with the Youghiogheny & Ohio Coal Co., in Cleveland.

**Robert E. Kamm** has been named superintendent of the Peters Creek Coal Co., Summersville, W. Va., according to an announcement by James D. Ireland, president. The promotions of **Ballard Irvin** to production superintendent, and **King Roark** to master mechanic also were announced.

Promotion of **John J. Huey** from chief electrical engineer to director of research and machinery development for the United Electric Coal Cos. was an-

## *You Can Give Public Relations a Grassroots Boost*

A number of coal men saw "A Letter to the Editor" (p 78) in booklet form. Bituminous Coal Institute published it in February and mailed copies to National Coal Association members and others.

Some of the men who saw that booklet wrote in and said they liked it. Here are a few of the things they said:

"A fine job, just the kind of job I would like to have done myself. I think you have done the industry a real service."

"Your analysis of Mr. Martin's article was well written and to the point, and you certainly corrected many erroneous impressions."

"A good piece of writing; a wealth of well-documented facts; . . . and all written in good temper."

"I firmly believe that statements such as those of John Bartlow Martin should never go unchallenged."

But between the lines of these letters ran a current of thought something like this: "We've made a lot of progress in safety, worker welfare and mechanical mining. But you'd never know it from the articles authors write and editors publish. Readers get the same stories they read a generation ago about coal. It's frustrating and discouraging. Can we do anything about it?"

Coal men might as well face it: Sin, being more interesting than virtue, makes the headlines. That's why it's hard to find favorable public opinion of coal.

What will it take to bring people around? What's the price of favorable public relations?

Here's the price:

**1. Patience**—It takes a long time to educate people, especially when they have to unlearn outdated facts and catch up with new facts. But you'll gain more by patience than by verbal assault and mayhem.

**2. An orderly house**—As long as men are hurt or killed in anybody's mine, as long as miners live anywhere in substandard houses, as long as there's a primitive doghole where coal is mined, somebody will use those facts to indict the whole coal industry. That's why it's not enough for your company to be ahead of others. Your company also must be a leader. To be a leader, it must pull others close behind—by example, encouragement and, if necessary, blunt talking.

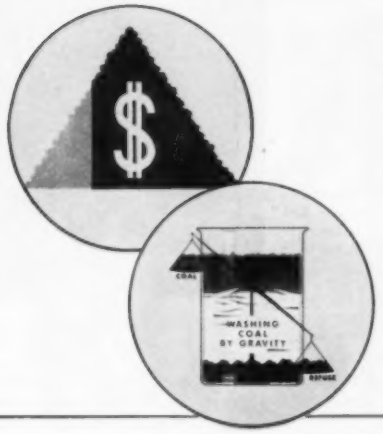
**3. More progress, faster**—Granted, a speed-up in progress will cost more money. But it'll be money well invested. Failure to invest may cost you plenty in loss of prestige, goodwill and paying customers.

**4. Grassroots work**—Home is the place where you can do the most good. Not so long ago, for example, Christopher Coal Co., Pursglove, W. Va., brought a local editor around to an informed point of view about burning gob piles (*Coal Age,* June, 1951, p 90). Company officials simply said, "Come around and see what we're doing about gob fires." The invitation paid off in a favorable newspaper article.

And in West Frankfort, Ill., the editor of the local newspaper rose ably to defend his town and his coal-mining neighbors following publication of a contorted newspaper story about them in a St. Louis newspaper.

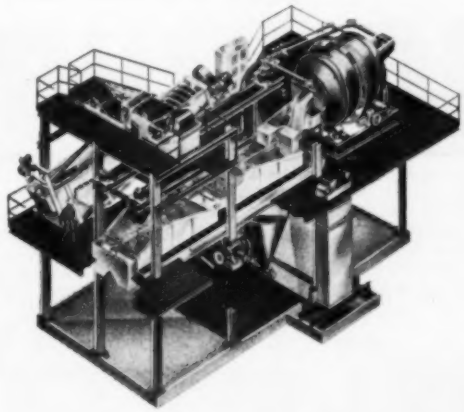
That's what it takes to cultivate sound grassroots public opinion—telling the facts to newspapermen, free-lance writers, editors, news photographers, radio men and others who shape public sentiment. The solid grassroots strength you create among them will spread upward to wider areas and will merge with the nation-wide strategy of industry agencies, such as BCI. BCI is doing its part. You can help by doing yours back home.

# CONTROLLED CLEANING produces COAL PROFITS




Profitable coal cleaning in today's market requires control of washing operations with low cost, efficient methods.

The newest, most efficient coal cleaning method for most operations is Heavy-Media Separation with WEMCO MOBIL-MILLS.



You have a choice of three types of Mobil-Mills in selecting a washing plant to fit your particular requirements:

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Prime advantages of WEMCO MOBIL-MILLS for coal cleaning are:

Efficiency of cleaning
Accurate control of operations
Low investment per TPH of washed coal
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nounced last month by H. A. Reid, vice president in charge of operations. An electrical-engineering graduate of the University of Minnesota, Mr. Huey was associated with the Westinghouse Electric Corp. from 1933 to 1941. He joined United Electric in 1941 and has served as chief electrical engineer for some years. He will be located in the company's Chicago office.

**John E. Moore** has joined the Coalburgh-Kanawha Mining Co., Coalburgh, W. Va., as mine superintendent, according to an announcement by J. A. Willis Jr., vice president. Mr. Moore was formerly employed by the Ames Mining Co. as mine foreman at the Freese mine, Ethel, W. Va.

**A. L. Franz,** since 1949 executive vice president of the Colorado Fuel & Iron Corp., has been elected president of the company, succeeding **Carl W. Meyers,** elected vice chairman of the board of directors. Previous to 1949, Mr. Franz was vice president in charge of operations and also managed two of the company's largest plants.

**Gilbert S. McClintock,** chairman of the board of directors of the Glen Alden Coal Co., has been named to the Anthracite Operators' Wage Agreement Committee. Mr. McClintock succeeds the late Edward Griffith, Glen Alden president.

**Woods G. Talman** has been named assistant general superintendent for the Gary, W. Va., and Lynch, Ky., districts of the U. S. Steel Co. Coal Div., with headquarters in Gary. Mr. Talman replaces **Lloyd Lineberry,** who has been appointed district superintendent for West Virginia mines.

**Monroe J. Mechling** has been appointed safety director for all mines of the Valley Camp Coal Co., Elm Grove, W. Va. Mr. Mechling joined the USBM in 1941 and had held various inspection and supervisory positions until named head of the Fairmont, W. Va., office last year, the post he held on joining Valley Camp. Before joining the Bureau, he had served as safety director for the North American Coal Corp. and in various posts for the Clarkson Coal Mining Co., including general superintendent of mines.

**John W. Buch,** chief anthracite subregion, USBM, Schuylkill Haven, Pa., last month received a Department of the Army "Certificate of Appreciation" for his contribution to the World War II effort in industrial intelligence. After 13 yr with The Hudson Coal Co., Mr. Buch served on the faculty of Penn State College for 4 yr and from 1942 to 1944 was chief of the USBM Coal Economics Div. in Washington. During the war, he served with the Technical Industrial Intelligence Committee, which worked with the Joint Chiefs of Staff.

**George P. Resick,** Spangler, Pa., and **William E. Ray,** Seward, Pa., have been appointed Pennsylvania bituminous mine inspectors.

Appointment of **Lawrence B. Berger** as chief of the Health Branch, Health and Safety Div., USBM, was announced March 8. Mr. Berger has been active in the Bureau efforts to combat health hazards since joining the Bureau as a laboratory aide in 1919. He has acted as head of the Health Branch since the transfer of Dr. H. H. Schrenk to the Public Health Service in 1948.

## Obituaries

**William W. Wilson,** 53, superintendent, Westland Div., Pittsburgh Coal Co. Div. of Pittsburgh Consolidation Coal Co., died Feb. 22 after a short illness. Mr. Wilson had been employed at the company's Westland mine for some 25 yr.

(*Continued on p 154*)

**CALVIN HOLMES,** 74, active in the coal industry since 1896, died Feb. 23 in the Ft. Sanders Hospital, Knoxville, Tenn. Widely known throughout the industry, Mr. Holmes at the time of his death was president of the Holmes-Darst Corp. and associated companies, and was a director in various organizations, including the National Coal Association and Appalachian Coals, Inc. Mr. Holmes began his long career in the industry with the Campbell Coal Co., Atlanta, in 1896. He was one of the organizers in 1909 of the Bewley-Darst Co., the predecessor of the Holmes-Darst Coal Corp. From 1916 to 1922 he was active in the Blue Diamond Coal Co., selling his interest in 1922, when he became interested in the Harvey Coal Corp., Inc., which he also headed at the time of his death.

# COAL MEN ON THE JOB

**FIRST INTERNATIONAL CONFERENCE** on Coal Gasification: Dr. A. C. Fieldner (left), chief fuels technologist, USBM; Dr. Milton H. Fies, manager of coal properties, Alabama Power Co.; Howard Blakeslee, science editor, The Associated Press; John D. Battle, executive vice president, National Coal Association; Ivan Lavergne, secretary, coal section, OEEC, Paris; and August Fischer, mine manager, Unna, Germany.

**BCR ANNUAL MEET** (right photo): M. F. Cunningham (left), vice president, Goodman Mfg. Co.; Max Forester, vice president, Pittsburgh Consolidation Coal Co.; and T. F. McCarthy, vice president, Clearfield Bituminous Coal Corp.

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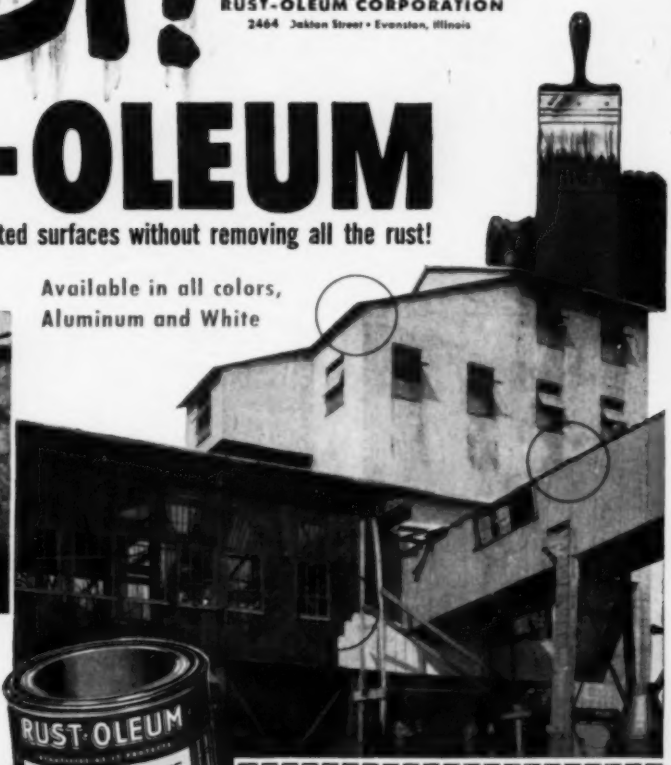

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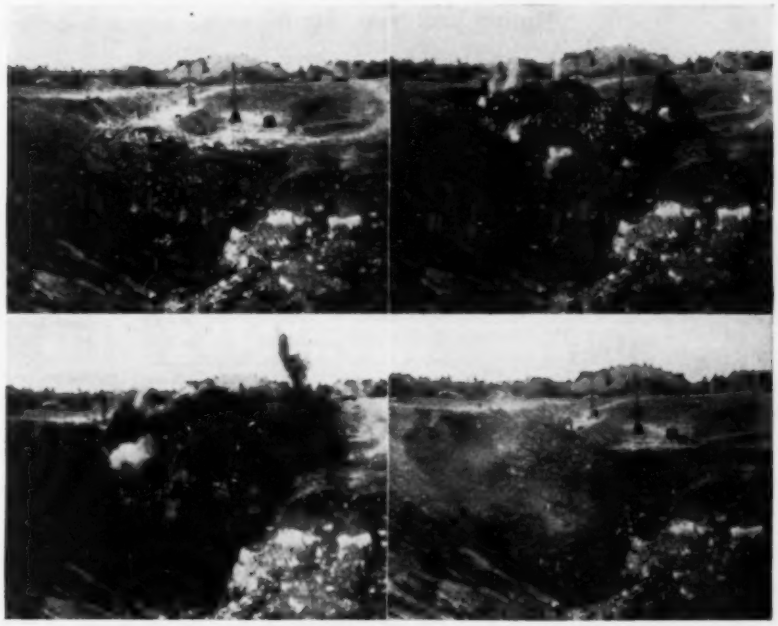
# What Really Happens When a Blast Is Shot?

*Machine-gun camera photos taken at Chisnell Coal Company, Hazleton, Pa., "freeze" the blast for close study and analysis.*



## . . . the Machine-gun Camera Sees All, Tells All!

The machine-gun camera with its big lens and rapid shutter makes a "stop-action" record of what the human eye can't follow. It automatically snaps three photos a second on five-inch film.

Atlas technical men use the machine-gun camera to "freeze" the action of blasts in strippings, quarries, and construction jobs. They have caught as many as 42 pictures of a single blast—a photo sequence that tells exactly what happens from the instant of detonation till the dust settles.

Your Atlas representative will be glad to show you through the eye of the machine-gun camera how *you* can profit by using the correct numbers of the sixteen ROCKMASTER® milli-second delay detonators teamed with the ROCKMASTER system of explosives choice and loading methods.

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*"Everything for Blasting"*

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# Mining, Preparation and Gasification Coal Division Themes

**Mining problems, better preparation, handling frozen coal and progress and prospects in coal gasification studied in Coal Division sessions at AIME annual meeting.**

COVERING THE FIELD of coal's interests, the program of the annual meeting of the Coal Division, AIME, in New York City, Feb. 18-21, included papers and discussions concerning deep mining problems, strip-mine power and overburden removal, evaluation and design of preparation plants and equipment, reducing the cost of cold-weather coal handling and the past, present and future of coal gasification in the United States and other countries.

**AIME MEETING—A SPECIAL COAL AGE STAFF REPORT**


**Coal Preparation** ..... p 181
**Handling Frozen Coal** ... p 186
**Gasification,**
**Hydrogenation** ..... p 188
**Economics of Gasification** p 194
**Coal Hydrogenation** .... p 198


## DEEP AND STRIP MINING

The effects of Sewickley-seam mining on later Pittsburgh-seam mining, drilling and blasting in anthracite stripping and modern power practice at an anthracite strip mine were subjects at the Monday morning session, with C. M. Donahue, Mine Safety Appliances Co., Pittsburgh, Pa., and F. J. Reed, Republic Steel Corp., Uniontown, Pa., as co-chairmen.

In describing the difficulties encountered in mining the Pittsburgh seam in northern West Virginia after the overlying Sewickley seam has been worked out, F. R. Zachar, general superintendent, Christopher Coal Co., Pursglove, W. Va., pointed out that blocks of Sewickley coal left in place by earlier operators in the upper bed now complicate mining in the Pittsburgh seam by transmitting roof stresses which break up the Pittsburgh roof to a degree that makes recovery extremely difficult. The interval between the seams consists of 61 ft of shale, 18 ft of limestone and another 6 ft of shale, with the thin Redstone seam lying about 35 ft above the Pittsburgh.

In some instances, localized squeezes in the Pittsburgh seam have forced abandonment of entire trackless sections, Mr. Zachar said. Studies of overlay maps of both seams show that these squeezes occur in areas under Sewickley-seam blocks, which vary in size from 100 x 100 ft to 200 x 400 ft and larger. These conditions show up in mining solid coal in the Pittsburgh seam. Narrower openings, roof-bolting at intersections and steel crossbars have been to no avail, Mr. Zachar reported. To keep haulageways open, it has been necessary to build solid cribs along both ribs. However, overlay maps have helped company engineers predict where trouble may be expected, thereby permitting mine projections to be laid out in the most advantageous manner.

On the subject of drilling and blasting in anthracite stripping, C. T. Butler, vice president, Central Pennsylvania Quarry, Stripping & Construction Co., Hazleton, Pa., surveyed up-to-date practice in deep overburden. Vertical drilling predominates because of the depth of the cover and, until recently, churn drilling was the rule, almost without exception. Rotary drilling now is being used in sinking holes 60 ft deep or more. In most instances, insensitive ammonia-type explosives are preferred, with detonation by millisecond delay electric caps or detonating-cord delay connectors.

Power facilities at the anthracite strip mine of the Shen-Penn Production Co., Shenandoah, Pa., include a 3,000-kva substation, pole lines for primary distribution and trailing cables from the pole lines to working units, F. C. Pearson.

(*Continued on Page 181*)

## Rolla Students Roll Crosscountry To New York AIME Meeting

THIRTY-SEVEN mining-engineering students took a 2,300-mi round-trip bus journey from the Missouri School of Mines, Rolla, Mo., to attend the 4-day meeting of the AIME in New York City in February. Travel costs were paid by Sinclair Coal Co., Kansas City, Mo., which chartered the bus for the trip.

The students left Rolla at 8 am Saturday, Feb. 16, and with only short breaks for meals and a longer stop in Pittsburgh, Pa., Sunday morning to attend church, arrived in New York Sunday evening. For the return trip, they boarded the bus Friday morning, arriving at Rolla Saturday evening.

Details of the trip were arranged by T. C. Cheasley and Jack Reese, both of Sinclair Coal Co., and Prof. J. D. Forrester, chairman, Department of Mining Engineering, Missouri School of Mines. William M. Shepard, graduate assistant in mining, was in charge of the trip.

Students were selected for the trip on the basis of AIME student membership, scholastic standing and engineering promise. Coal-mining majors were given first preference. Students were guests of the Missouri School of Mines New York Alumni Section at a dinner Feb. 19.

Approximately half of the students worked at various sessions of the meeting as lantern-slide operators or in other jobs. These work assignments helped pay room-and-board costs during the New York visit. Rooms were made available for most of the students at Sloane House YMCA.

# IF...YOU'RE MINING VERY LOW COAL...

*Joy 20-BU-1 in 28" coal*

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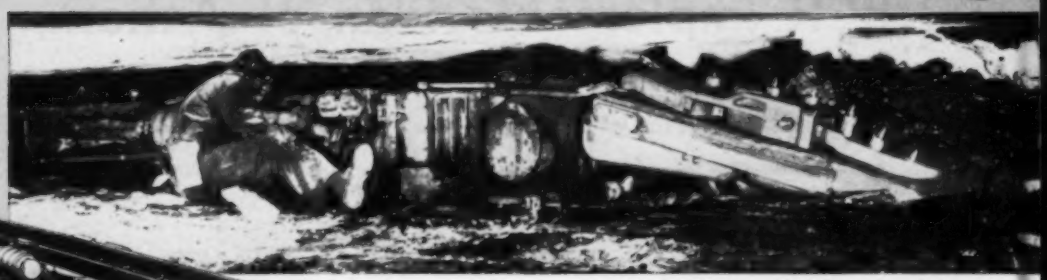


*Joy 20-BU-1 loader and 8-SC Shuttle Car in 30" coal*

## ...use the JOY 20-BU-1 LOADER!

The JOY 20-BU-1 was developed to meet the increasing demand for a coal loader that could operate in really low coal. Although the unit is only *24" high*, its loading speed is up to 8 tons a minute!

An exclusive feature of the 20-BU-1 is the independent drive of the conveyor and gathering head. While a shuttle car is away, the gathering arms continue to operate and can provide a fully loaded conveyor ready for quick loading when the car returns. This independent drive also permits continued loading by the conveyor even if the gathering arms are momentarily stalled with hard digging.

The 20-BU-1 is a field-proved—tried and true—machine that is boosting production and profits in low vein coal mining everywhere. Let us show what it will do for *you!*

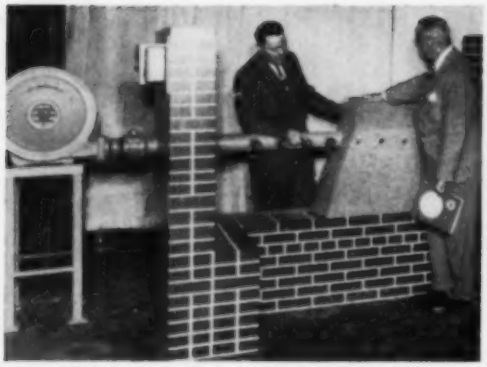
*Consult a Joy Engineer*

CL-4138

# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



**RESEARCH PAYS OFF** **OVERFIRE JETS** to abate smoke from stationary plants are discussed at BCR meeting by Henry C. Woods (right), Sahara Coal Co., and Sherman Larsen, Pliojet Div., Plibrico Jointless Firebrick Co.

**MARKET POTENTIALITIES** of BCR-developed coal-burning crop drier for corn, hay and grain hold interest of J. E. Tobey (left), Appalachian Coals, Inc.; C. R. Mabley, Island Creek Coal Sales Co.; and J. N. Geyer, Imperial Coal Corp. Newly developed tobacco drier also was exhibited.

# BCR Implements Plan of Action

## 1951 Mileposts for BCR . . . Progress in research, better public relations, Plan of Action formulated

VOTING MEMBERS OF BCR's sponsoring companies authorized BCR directors and staff to proceed with plans for an enlarged research and development program to expand coal sales at the annual meeting of Bituminous Coal Research, Inc., Chicago, Ill., Feb. 28. The action of the voting members was set forth in a resolution, as follows:

"Resolved: That the actions of the board of directors with respect to suggestions of the Plan-of-Action committee for an expanded research program be approved, and that the board be requested by the membership to set in motion the recommended effort to obtain the support of a minimum of 150,000,000 tons of annual production" at increased membership rates to support the new program. It was emphasized that until such time as this minimum tonnage is pledged the present program will continue at the current rates. The complete plan of action, as drawn up by the committee appointed by Dr. A. A. Potter president, BCR, appears in *Coal Age*, February, 1952.

Also at the business session BCR officers were elected as follows: A. A. Potter, president; H. J. Rose, vice president and director of research; R. H. Sherwood, first vice president; R. E. Salvati, vice president; C. A. Reed, secretary; M. L. Garvey, treasurer, and J. F. Hanley, assistant secretary-treasurer.

### PROTECTION FOR FUTURE

As chairman of the general meeting, Dr. Potter, in his opening remarks described good research as the only certain protection for the coal industry's future. In view of rising demand, generated by the need for strong national defense, the industry may be called upon to produce up to 560 million tons in 1952, Dr. Potter said. Fast-growing utilities, progress in gasification and rising export tonnages are bright spots, but for the long pull the domestic heating market must be protected and new outlets developed. This demands productive research, which in turn requires adequate funds to do the job properly, Dr. Potter pointed out. There may be a long "shirt-losing" stage between the completion of research and the return on the investment, Dr. Potter warned, in emphasizing that research cannot guarantee results if promotion lags.

### GAS-TURBINE PROGRESS

Continued progress in the development of the coal-fired gas turbine was reported by Peter R. Broadley, associate director, locomotive development program. In early July, 1951, a new Allis-Chalmers unit was placed on test at the Dunkirk, N. Y., laboratory, and while it is rated at 3,750 hp it has developed up to 4,180 hp, Mr. Broadley reported. Thus the new unit is definitely in the same league as its diesel competition. Test units have been operated 1,250 hr on Ohio No. 8 and Pocahontas coals. Data from these tests show that on-the-tender average costs for railroad fuel are 22¢ per million Btu for coal against 76¢ per million Btu for oil.

In addition, the problems of flyash removal are being overcome since it appears that the new Dunlab separator, a product of LDC research, is functioning satisfactorily, Mr. Broadley said.

Tests with the new unit show that at 4,000 hp, coal is $11.50 per hr cheaper than oil, making possible savings of up to $60,000 per locomotive per yr. Post-test inspections of the unit show also that turbine blades are standing up well under sustained high loads, Mr. Broadley reported.

In a novel telephone hook-up with the Dunkirk laboratory, the start of a new 750-hr test was heard by some 240 members and guests at the Chicago meeting. The conversation between Mr. Broadley and the research staff at Dunkirk was amplified for those in attendance. The unit will operate three 8-hr shifts per day, five days a week, under varying conditions of load to supply additional required data.

### MDC WORK PAYING OFF

Tangible proof in a number of newly-developed units that mining development research is paying off is a source of satisfaction to BCR subscribers, Gerald von Stroh, director, MDC program, stated, in reporting that some units developed through BCR funds and support have been taken over by equipment manufacturers.

In numerous tests, MDC Test Unit No. 2 has proven its ability to produce a coal

*(Continued on Page 176)*

***INDUSTRY MEETING***
**—A Special Coal Age Staff-Written Report**

# QUALITY CLEAR THROUGH...

**American AC-6 Coal Crusher**

*Capacity:*
*300 tons per hr.*
*ROM to 3/4"*

American Crusher quality is being constantly reaffirmed by case histories coming in from power plants, central stations and mines throughout the country . . . records which are proving beyond a doubt American's superlative performance and economy of operation. Here, for example, are the

***Cost Surveys of 29 American Installations***

| | |
|---|---|
| Total Tonnage Handled | 61,000,000 Tons |
| Average Age of Crushers | 9.5 Years |
| Replacement Parts (Includes Standby Parts) | 1/10 of 1¢ per Ton |

***THERE CAN BE NO BETTER PROOF OF QUALITY!***

## American PULVERIZER COMPANY

*Originators and Manufacturers of Ring Crushers and Pulverizers*

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# New Mine Developments

### Pa. Coal & Coke Seeks Coal

New coal sources in West Virginia are being sought by the Pennsylvania Coal & Coke Corp. to meet its expanding demands for both export and industrial coals, Harry M. Brown Jr., inspector and buyer for the company, announced Feb. 26 while in Charleston, W. Va. The company plans to export more than 2,000,000 tons this year, he said, and is seeking high-grade bituminous coals for metallurgical, locomotive, gas and general-steam purposes to supplement output from its own operations. Establishment of export operations is part of the company's expansion program announced last year after a change in management, it was reported.

### Kaiser to Expand Coal Output

As a part of a $65 million expansion program, Kaiser Steel Corp., plans a major increase in coal production at its Sunnyside, Utah, mines. The program includes additions to equipment and machinery and new homes for additional miners. The additional coal is required for the greatly expanded operations planned at the company's Fontana, Calif., steel plant, which are expected to boost Kaiser's pig iron ouput by 50% to 1,300,000 tons annually and raise steel ingot production by more than 11%. The improvement program, which is expected to boost the 1-million-ton current output of the Sunnyside mines to some 1,635,000 tons annually, includes: modification of existing dewatering and clarification facilities in the preparation plant; a new rock-dump installation; new coal breaker; and modification of the coarse-coal cleaning and screening equipment and raw-coal handling equipment. Among other new facilities planned is new hoisting equipment at Mine No. 1, together with additional mine cars, locomotives, shuttle cars, loading, cutting, drilling and roof-bolting machines and other equipment. On completion of the program, some 800 men will be employed, an increase of 100 over last year's average. The new plans represent the second major step toward increased production at Sunnyside in the last few months. Completed in February was a new high-speed haulageway to the coal tipple, requiring 3,000 ft of tunneling, which shortens considerably the distance from the workings to the tipple and provides direct access as well as a nearly level roadbed over the full route.

### Central Appalachian Takes Mine

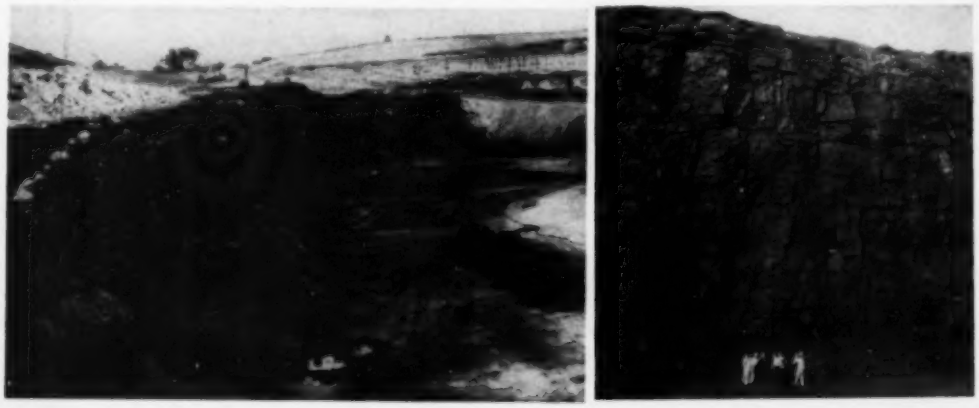
Following original plans, the Central Appalachian Coal Co. Jan. 1 took over operation of the Morris Creek mine, near Montgomery, W. Va., which had been developed and operated for it by the Coal Div. of EG&FA. Employees have been transferred to the Central Appalachian payroll, but EG&FA will continue to supervise operations from a top-management level and will receive an operating fee and a royalty on coal produced.

### Co-op Mine Trial Closes

End of the miner-cooperative operation of the former Bell & Zoller Mine No. 7 as a result of slow market conditions was reported Feb. 27. The mine had been re-opened last November for a 90-day trial period by Number Seven, Inc., a cooperative formed by members of PMWA Local 18, Staunton, Ill., who had lost their jobs when the mine was closed as uneconomical by Bell & Zoller in August. Capital for the trial period reportedly was supplied by Adolf Lubin, of Springfield, and the Zeigler Coal Co. permitted use of the property on a royalty basis. The miners contributed 10-days work as a part of getting the operation resumed. In announcing the closing, John Hittmeir, manager of operations, emphasized that the miners had worked hard and were not responsible for the shut down. Lack of demand for coal played the major part, although new mining laws and the difficulty of securing insurance were factors, he said.

### New Firm Acquires Pa. Mines

Organization of the Elma Smokeless Coal, Inc., to take over the Somerset County operations of the Baker-Whitely



## Americans Plan Australian Coal Expansion

THE FABULOUS COAL DEPOSITS at Blair Athol, Queensland, Australia, estimated to hold some 250 to 400 million tons within a 5-sq mi area, are expected to be effectively tapped by plans being developed by a group of Americans. The program calls for construction of a new railroad direct to tidewater some 150 mi away, modernization of the harbor and expansion of the present open-cut mine to an initial production of 3,000,000 tons annually, with an investment of $60 million. The present output of the local company in which the Americans have acquired an interest, averaging 300,000 tons a year, has been limited by the inadequacy of the narrow-gage rail facilities.

Blair Athol reportedly is the largest known deposit of black coal in the Southern Hemisphere. The coal seam averages 83 ft thick and area now being worked is 110 ft thick (above). Overburden averages 65 ft. The coal is a 12,190-Btu, non-coking bituminous, with no bands or impurities, and can be marketed without washing or cleaning. The coal also is considered a good prospect for synthetic gasoline, which could be made and landed in Brisbane for less than 10¢ per gallon, according to a British expert. For the first 50mi the proposed rail line will run over known coal deposits, many as thick as Blair Athol but at greater depths, and also will pass over a coking-coal field yet untouched because of lack of transport.

Prominent among the Americans involved are Douglas V. Lewis and Edward B. Nevin, of New York, already sizeable investors in the field, Gen Bill Donovan, wartime chief of the OSS, is counsel for the group, and W. W. Hall is conducting negotiations in Australia.

# LOCOMOTIVE CABLES

***Roebling ROEPRENE Mine Locomotive Cables***

***last longer . . . cost less on the job!***

ROEBLING PUTS EXTRAS into Roeprene Cables . . . gives their outer jackets a special curing that makes them tougher and better able to withstand the roughest sort of wear. They're outstandingly flexible, too. Their single conductor is insulated with a heat- and moisture-resistant compound. The Roeprene sheath is permanently bonded to the insulation by open reinforcing cords.

A big part of Roebling's complete electrical wire and cable line is now required in our nation's rearmament program, but your Roebling Distributor and the Roebling organization will certainly try to render the best service possible. John A. Roebling's Sons Company, Trenton 2, New Jersey.

Tinned, copper conductors, Class G and H, rope stranded for greater flexibility, and increased flex-life.

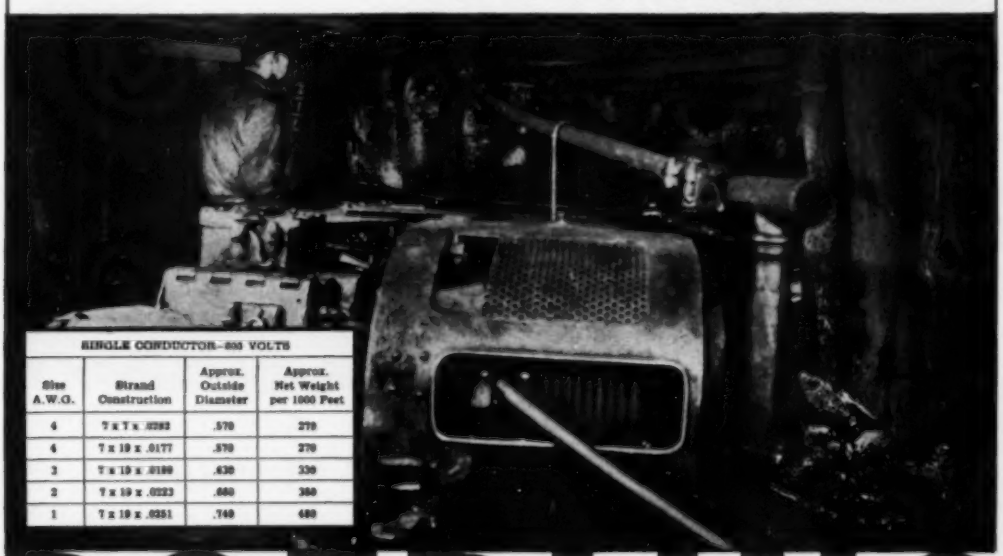
Insulated with high grade heat resistant rubber compound for longer mine service life.

Woven cotton reinforcing imbedded in jacket and insulation, bonding the cable into a solid unit without affecting flexibility.

Roeprene (Neoprene) sheath, lead mold cured for high mechanical strength and resistance to abrasion, sunlight, cutting, oils, acids, greases and alkalies.

**FLAME RESISTANT**

Roebling Roeprene Mine Locomotive Cables are marked P-111-BM, indicating approval by the Pennsylvania Bureau of Mines, and acceptance by the U. S. Bureau of Mines.



| SINGLE CONDUCTOR—600 VOLTS | | | |
|---|---|---|---|
| Size A.W.G. | Strand Construction | Approx. Outside Diameter | Approx. Net Weight per 1000 Feet |
| 4 | 7 x 7 x .0262 | .570 | 270 |
| 4 | 7 x 19 x .0177 | .570 | 270 |
| 3 | 7 x 19 x .0199 | .630 | 330 |
| 2 | 7 x 19 x .0223 | .680 | 360 |
| 1 | 7 x 19 x .0251 | .740 | 480 |

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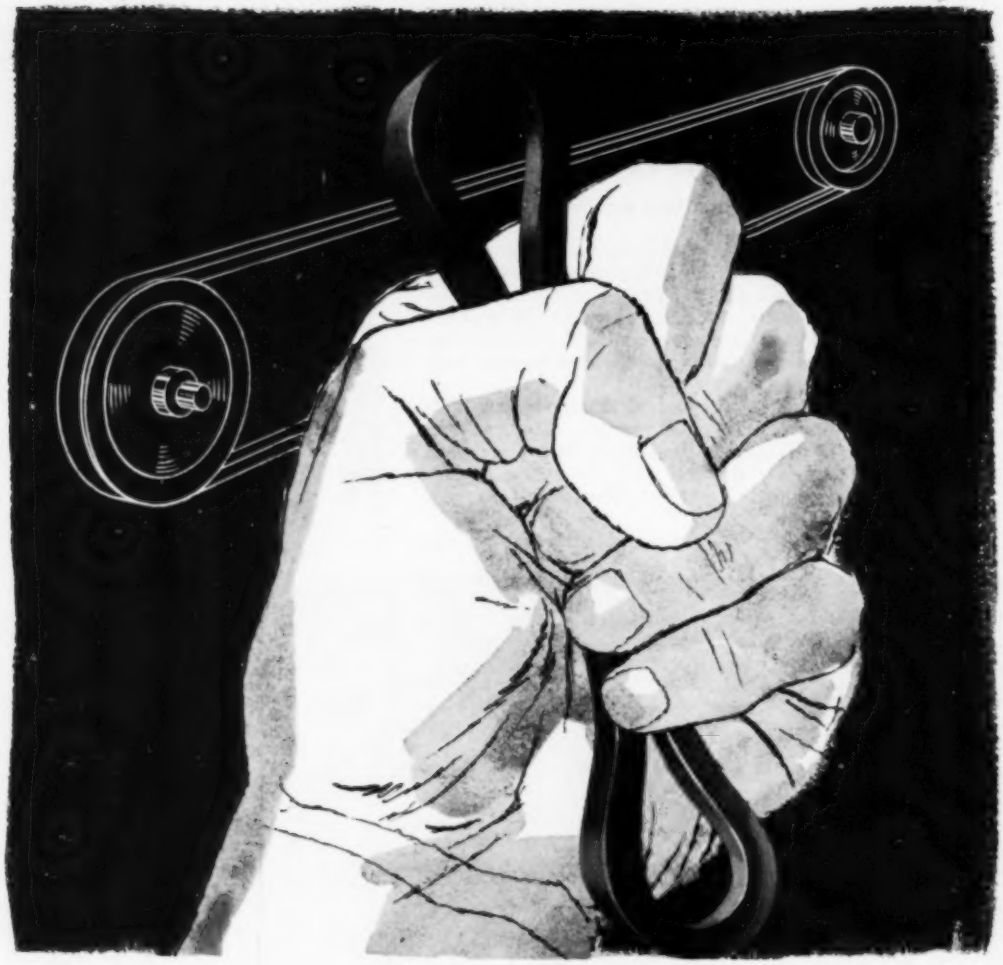

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## COMING MEETINGS

**American Mining Congress:** 1952 Coal Convention, May 5-7, Netherlands Plaza Hotel, Cincinnati, Ohio.

**Tenth Annual Anthracite Conference:** May 8-9, Lehigh University, Bethlehem, Pa.

**Southern Appalachian Industrial Exhibit:** May 14-16, Bluefield, W. Va.

**Rocky Mountain Coal Mining Institute:** 47th annual convention, June 2-4, Broadmoor Hotel, Colorado Springs, Colo.

**Mine Inspectors' Institute of America:** 42nd annual convention, June 9-11, Sterling Hotel, Wilkes-Barre, Pa. (Secretary, C. A. McDowell, 427 Park Ave., California, Pa.)

**West Virginia Coal Mining Institute and Central Appalachian Section, AIME:** joint meeting, June 20-21, Prichard Hotel, Huntington, W. Va.

**Stoker Manufacturers' Association:** annual meeting, June 23-24, South Shore Inn, Lake Wawasee, Syracuse, Ind.

Coal Co. recently was announced. E. J. Newbaker, formerly superintendent of the Baker-Whitely operations, is president and general manager of the new firm, which has acquired the Elma Nos. 2 and 3 mines, near Hooversville, Pa. Other officers are his wife, Elizabeth R. Newbaker, vice-president; J. B. Ober, secretary-treasurer, and Merle Robinson, mine superintendent.

### Glen Alden to Buy Breaker; Close Audenried Colliery

Plans for the closing of its Audenried colliery, near Hazleton, Pa., at the end of March were announced by the Glen Alden Coal Co. last month. At the same time, the company reported that it had made an agreement to purchase the Junedale breaker of the Middle Eastern Coal Co., Inc. Closing of Audenreid was attributed to the uneconomical operation of the breaker and mine property. Employees are to be offered employment at the company's other operations. The Junedale breaker will be used, it was said, to prepare R-O-M coal purchased by the company in that area from outside sources, as well as to handle such coal as may be profitably mined from the Audenried property.

### Strips in Greenup County, Ky.

The Northeast Kentucky Coal Co. reportedly planned to open March 15 its new 2,000-tpd strip mine near Wurtland, Greenup County, Ky. W. B. Isaacs Sr., Lexington, Ky., is president of the organization, and T. L. Lambert, Kermit, W. Va., is general superintendent. B. H. Swaney & Sons, Inc., Clarksburg, W. Va., is the stripping contractor. The 40-in-thick Kentucky No. 7 seam is being mined and shipments will


Guarantee

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1. FIVE TIMES THAT OF UNTREATED GEARS.
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Pittsburgh ARMORED GEARS are sold to you with this positive guarantee of satisfactory service. It means that they will give you longer service, fewer work-stoppages, and lower operating costs.

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In those Lorain L-820's operating in a Pennsylvania strip mine, a Twin Disc Hydraulic Power Take-Off transmits power that "hangs on." A Model E Twin Disc clutch is also employed to permit a complete disconnect.

Power "hangs on" to keep the job moving when transmitted through a Twin Disc Hydraulic Power Take-Off.

For the engine *cannot be stalled by digging conditions.* The engine will continue to work at its *most effective torque* until it picks up the load, or is disconnected, even with the power take-off output stalled.

Acceleration of the load is smooth and rapid since the coupling slip cushions the drive and permits sustained engine horsepower output.

And just as the fluid drive *increases* work output, it *reduces* maintenance. "Shocks" never strike solid resistance . . . digging stresses and resulting strains are "absorbed" by the Twin Disc Hydraulic Power Take-Off.

It pays to put power to work through a Twin Disc Hydraulic Power Take-Off. Bulletin No. 144-B gives complete details.

**P. S. Try Twin Disc industrial Fluid drives on your conveyors, too. You can start them fully loaded.**

*Clutches & Hydraulic Drives*

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CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

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be made via the C. & O. Ry. and the Ohio River. Preparation equipment includes vibrating and shaker screens, crusher and washer, and all domestic and steam sizes will be available. The Richvein Coal Co., Cincinnati, is sales agent for the new property.

### W. Va. Companies Merge

Consolidation of the Jones & Heatherman Coal Co. and the Peach Creek Chilton Coal Co., Peach Creek, W. Va., under the name of the Ridgewood Coal Co. was reported last month, effective March 5. No changes in management or operations are anticipated, the announcement said.

## Preparation Facilities

**Paradise Collieries, Inc., Paradise mine, Paradise, Ky.**—Contract closed with McNally Pittsburg Mfg. Corp. for complete preparation and cleaning plant with R-O-M input of 650 tph; R-O-M broken to 6x0 in rotary breaker prior to washing in two McNally Norton automatic washers, with refuse from rotary breaker to ultimate truck disposal; rewash of crushed coarse-coal middlings in McNally Norton fine-coal washer; complete crushing and rescreen facilities for all plus 1¼- in washed coals; all ¼x0 washed coal hydraulically deslimed and fed to McNally-Rheo fine-coal launders for final rewashing; rewashed ¼-in by 48-mesh centrifugally dried; loading facilities on five tracks with complete mixing and blending.

## Association Activities

### Western Pa. Operators Elect

**G. A. Shoemaker**, president of the Pittsburgh Coal Co. Div. of Pittsburgh Consolidation Coal Co., was elected president of the Western Pennsylvania Coal Operators' Association at a directors' organization meeting following the annual meeting of the association March 6. Other officers elected were: Charles B. Baton, vice president; Harry A. Sutter, executive vice president; M. C. Briggs, treasurer; and Earl Glass, secretary. Named directors, in addition to Messrs. Shoemaker and Baton, were: J. Allan Brookes, F. H. Coleman, J. M. Connor, J. E. Elkin, H. C. Goodhart, Wenman A. Hicks, James R. Jamison, W A. McBride, C. C. McGregor, C. W. Pollock, Walter F. Shulten, E. A. Siemon and F. G. West.

### Big Sandy-Elkhorn Group Meets

A. M. Ayers, general superintendent, Russell Fork Coal Co., Praise, Ky., was elected president of the Big Sandy-Elkhorn Coal Mining Institute at the institute's annual banquet held Feb. 24. Mr. Ayers succeeded C. L. Sherman, superintendent, Stephens Elkhorn Fuel Corp. Elected vice presidents were M. E. Prunty, safety director, Consolidation Coal Co. (Ky.); Harry McCarthy, safety director, Clear Branch Mining Co.; and James Fleming, safety director, The Elk Horn Coal Corp. J. H. Mosgrove was re-elected secretary-treasurer. New directors of the institute elected were: J. T.

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# RIVETLESS CHAIN CONVEYOR PARTS

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Wilmot furnishes: -- Chain in pitches from 3" to 10½" and working loads from 3,000 to 130,000 lbs.; of drop forged alloy or cast chrome-manganese steels. Sprockets, traction wheels, flights, take-ups, shafting, bearings, casings and trough in cast iron, ductile iron, carbon or chrome-manganese steel. See how Wilmot's wealth of engineering and production know-how can solve your design and delivery problems.

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No. 314-MT for THIN SEAM
No. 516-MT for THICK AND THIN SEAM
No. 521-MT for THICK SEAM

DUFF-NORTON 5 TON RATCHET LOWERING JACK

Mining men everywhere tell us, "Duff-Norton 5 Ton Ratchet Lowering Jacks give dependable, long-lasting service in all lifting jobs in and around mines. They speed up rerailing of locomotives and cars; brace cutters, loaders and continuous mining machines; increase efficiency in track maintenance and shop repair work." You can't beat that for a recommendation. Why not order these jacks for your mine.

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You should have a copy of this handy booklet, which illustrates and describes in detail jacks that can make your lifting and lowering jobs easy and economical. Write for your copy today.

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*"The House that Jacks Built"*


## EQUIPMENT APPROVALS

Five approvals of permissible equipment were issued by the U. S. Bureau of Mines in February, as follows:

Joy Mfg. Co.—Type 11B-3PG/H mining-machine truck; two 4-hp motors, 220 and 440 v, AC; Approvals 2-836 and 2-836A; Feb. 7.

Joy Mfg. Co.—Type 8BU-11ALE/F loading machine; one 15-hp motor, 250 and 500 v, DC; Approvals 2-837 and 2-837A; Feb. 7.

Goodman Mfg. Co.—Type 6678 Tractor Tread loader; two 125-v 50-hp motors, 250 v, DC; Approval 2-838; Feb. 13.

Huwood-Irwin Corp.—15-hp conveyor power unit; one 15-hp motor, 230 v, DC; Approval 2-839; Feb. 19.

Mine Safety Appliance Co.—Model P special hand lamp; Approval 1026; Feb. 6.

Parker, Inland Steel Co.; M. K. Reed, Liberty Elkhorn Mining Co.; J. E. Green, Utilities Elkhorn Coal Co.; Edgar Dale, The Elk Horn Coal Corp.; V. A. Hensley, EG&FA; B. F. Gish, South-East Coal Co.; John L. Coyer, Republic Steel Corp.; Ward L. Reed, Turner Elkhorn Mining Co.; George E. Evans Jr., Glo Valley Coal Corp.; Mr. Sherman; I. C. Spotte, Princess Elkhorn Coal Co.; Arthur Bradbury, Inland Steel Co.; W. F. Diamond, Island Creek Coal Co.; C. H. Brown, Republic Steel Corp.; Seth Kegan and William Stapleton, Consolidation Coal Co. (Ky.).

### Keenan Heads Pa. Association

The Central Pennsylvania Safety Association has elected Dennis J. Keenan, general superintendent, Sterling Coal Co., Barnesboro, Pa., president of the organization for the fourth consecutive term. Clyde H. Maize, Pennsylvania state mine inspector, was elected vice president, succeeding the late Walter C. Fancourt. Joseph C. Leonard was re-elected treasurer and Sheldon Jones was renamed secretary. Barnesboro was chosen as the site for the annual competition to be held June 21.

### New Operator Organization

The Small Coal Operators' Association, Inc., Morgantown, W. Va., has been chartered by the state as a non-profit organization. Incorporators include Kermit R. Zinn, Masontown, Gasper Enrico and Clarence Friend, of Morgantown.

### Tell Others, Too . . .

NEWS OF YOUR ORGANIZATION is also interesting to others, so why not make it a point to inform COAL AGE of personnel changes among your staff members, mine-development plans and unusual company activities. Just write: The Editor, COAL AGE, 330 West 42nd St., New York 36, N. Y.

# What do you do when your v-belts get loose or break?

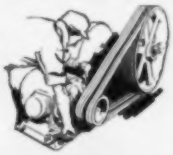
**1** **Leave the drive alone**

You get more slippage
- ...wasted power
- ...excessive belt wear
- ...uneven sheave wear
- ...less production

**2** **Slide the motor back**

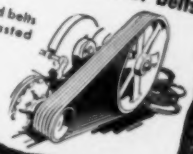
Tight belts get too tight

Life of belts and bearings is reduced



**3** **Install a new set of belts**

Discarded belts mean wasted money



**4** **Use VEELOS...**

***Only with VEELOS...***

the adjustable v-belt—can you get *all* these operating advantages. And *only* with Veelos can you eliminate costly v-belt inventory because just four reels of Veelos in the O, A, B and C widths can replace up to 316 different sizes of endless v-belts.

**VEELOS DATA BOOK...**

The plain facts on construction, installation and use of Veelos are included in this illustrated Data Book —write for your copy.

**MANHEIM MANUFACTURING & BELTING COMPANY**
**614 Manbel St., Manheim, Pa.**

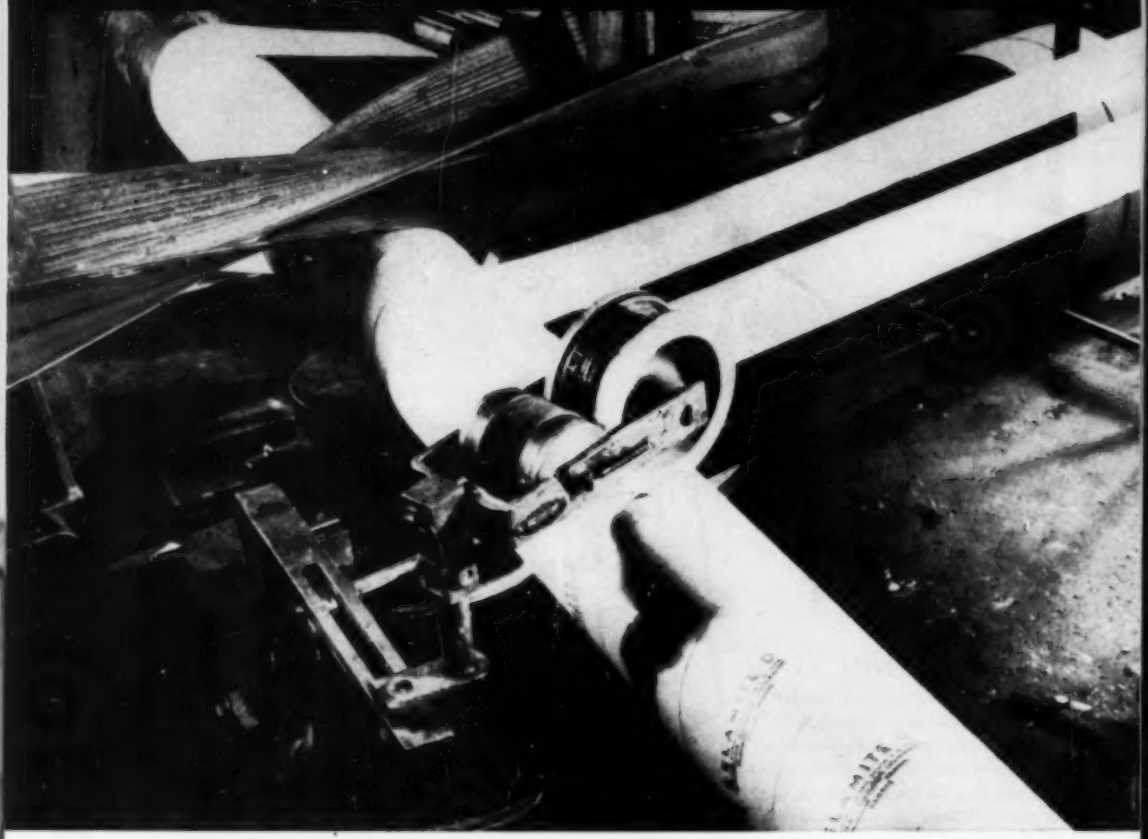
*Link construction permits quick installation*
*Easy adjustability*
*... provides controlled tension on each belt*
*... eliminates loafers*
*Keeps your machines running for profitable production*

**VEELOS**
THE LINK
**V-BELT**

**ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE**

Made in all widths in three types: regular, oil-proof, static conducting. Also double V in O, A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

# PROGRESS IN EXPLOSIVES . . .



## DYNAMITE, KING-SIZE

Did you know that dynamite comes in cartridges this big? Hercules pioneered in developing these larger cartridges which make for efficient blasting in large-scale coal stripping, open-pit mining, and quarrying operations.

These king-size cartridges range in diameter from 1¼ in. to 11 in. and weigh as much as 60 lbs. when filled. Spiral-wrapped in Hercules' own plants, they offer advantages in rigidity and smoothness. Other advantages: They are essentially their own shipping containers, are easier to handle and use, and can be stacked like cordwood.

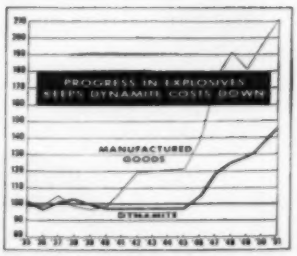



Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

HERCULES POWDER COMPANY
INCORPORATED

*Explosives Department, 936 King St., Wilmington 99, Del.*

xR52-3

# TRACTION You can trust

## 4-wheel drive PAYLOADER®

It takes traction in all kinds of going to get jobs done on schedule . . . traction you can rely on the year 'round . . . that handles big loads quickly, easily and economically.

Hundreds of mines, quarries and pits use Model HM "PAY-LOADERS" . . . many have placed repeat orders proving their satisfaction with the traction, flotation and all-around utility of this unusual wheeled tractor-shovel. They also value its ability to get to the job and around the job fast . . . the way it can do so many jobs — dig, load big hauling units, strip overburden, do clean-up work, maintain haul roads, carry tools and equipment, do crane work, pull and push.

Operators like its ease of operation, thanks to power-boosted steering, fingertip hydraulic control, the quick, easy shift between the four forward speeds and four reverse speeds. Once you see the Model HM "PAYLOADER" in action you'll want one too, so see your "PAYLOADER" Distributor or write The Frank G. Hough Co., 735 Sunnyside Avenue, Libertyville, Illinois.

WRITE for catalog on the 1½ yd. Model HM or the six other "PAYLOADER" sizes down to 12 cu. ft. bucket capacity.

**PAYLOADER®**

# GORMAN-RUPP PUMPS

*Give You*

**HIGHEST PUMPING EFFICIENCY**

**LOWEST MAINTENANCE COST**

*They Save*

**COSTLY SHUT-DOWN TIME**

Coal mine men consider these pumps the best insurance against pumping trouble and costly shut-downs.

Now, because of increased efficiency in the latest Gorman-Rupp design, 3 H.P. does what formerly required 5 H.P. Under full load, this means **40% savings in pumping costs.**

Gorman-Rupp pumps maintain nearly normal capacity under any working head and require very low headroom. Ideal for remote locations and control as they require **little or no** attention.

*Write today for special mine bulletin O-ME-11 or contact your nearest distributor.*

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THE GORMAN-RUPP COMPANY

306 BOWMAN STREET, MANSFIELD, OHIO


## Obituaries . . . From p 136

starting at the operation as a pumper. He served successively as assistant foreman, mine foreman and superintendent and was named division superintendent last year.

**Martin Calhoun,** 61, head of the Calhoun Coal Co. operating in the Elkhorn field of Kentucky, died Feb. 23 at Isom, Ky., following a sudden heart attack.

**H. A. McAllister,** 60, executive director, Logan County Coal Operators' Association, Logan, W. Va., was found dead in his hotel suite March 1. His death reportedly resulted from a self-inflicted bullet wound, for which friends and associates could offer no explanation. A graduate of Ohio State University, Mr. McAllister came to Logan in 1935. He had previously served as a professor at the University of North Dakota.

**Frank C. Shriver,** president of the Shriver Fuel Co., Baltimore, died Feb. 20, after a long illness. Active in West Virginia coal circles for many years, Mr. Shriver was one of the pioneers in the development of the Scotts Run field and had been associated with the industry during his entire business career. During World War II he was manager of the Fairmont office of the SFAW.

## News Briefs . . . From p 132

### Violence Continues in UMWA Kentucky Drive

The UMWA drive to unionize mines operating in Clay and Leslie Counties, Kentucky, was continuing last month. Two men were arrested March 3 in connection with the dynamiting of a road leading to the Garrand Coal Co., it was reported from Hyden, Ky. No arrests had been reported in connection with a fire that caused some $20,000 damage at the tipple of the Henson & Crawford Coal Co., in Clay County. On March 8, it was reported, 18 shots were fired at two watchmen at the tipple of the Citation Coal Co., in Leslie County.

Earlier on Feb. 23, operators of the New Hyden and Citation Coal Co. asked for contempt citations against 32 UMWA members, charging that mass picketing of their properties violated court orders issued last summer. At a hearing March 10 in the Leslie County Circuit Court, action on the contempt charges was delayed indefinitely, since the union had earlier moved to discontinue the mass picketing. UMWA workers at the two mines who had been striking to gain union recognition had voted Feb. 28 to return to work without a contract. According to reports, both mines had continued partial operation with employees who were not UMWA members. Approximately 120 men are employed at the two operations.

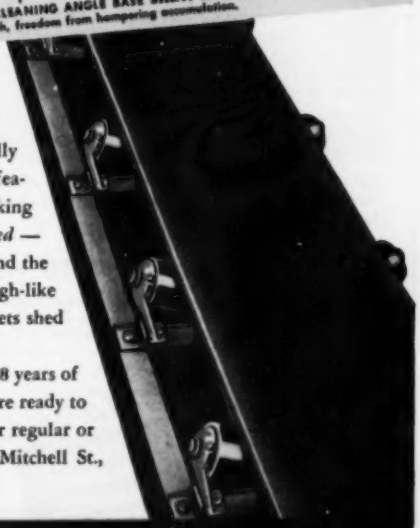
# Lippmann *life-sealed* Ball Bearing Idlers

SHAFTS ARE FIRMLY HELD in place, yet loosening a set screw makes them simple to remove if necessary.
CLOSE ROLL SPACING provides maximum belt support, guards against pinching belt, minimizes crossing. Perfectly concentric assembly gives smooth operation with less wear and tear.
PERMANENT LUBRICATION eliminates periodic greasing. No costly catwalks. No danger of bearing opposite grease fitting not being lubricated when grease congeals. Bearings positively sealed against dirt and moisture.
DEAD SHAFT operation means larger bearing area to take radial load.
BALL BEARING action is life-time true-running, takes both thrust and radial loads. Bearings can't drag.
STUB SHAFT saves cost, saves weight, is self-aligning.
TROUGH RING on idler heads plus headed bracket shed dirt and water—give additional protection to bearings.
HEAVY WELDED steel base with triangular section gives absolute rigidity and sheds dirt.
ALL ROLLS IDENTICAL for complete interchangeability, eliminating "less-time" fitting.
TOUGH MALLEABLE IRON support brackets are extremely rigid and accurately located.
DISHED, HEAVY-SECTION idler heads pressed and rolled into machined seat in tube give permanent alignment for bearings and idler faces.
SLOTTED BASE HOLES permit quick, easy adjustment and alignment.
SMOOTH, ROUNDED, CONTINUOUS ROLL EDGES for longer belt wear and smooth action.
SELF-CLEANING ANGLE BASE assures added strength, freedom from hampering accumulation.

## Shielded for hard mining service

Meet the champion of heavy duty conveyor idlers, built specifically for hard mining service! Compare its construction, feature by feature, with *any* other and you'll agree it's the idler you've been looking for. These Lippmann Life-sealed idlers are *permanently lubricated* — the cost of catwalks and periodic greasing has been eliminated and the bearings are sealed against water, dirt and wear. In addition, trough-like rings on the idler heads shielded by hoods on the support brackets shed dirt and water away from the bearings.

Lippmann conveyors and other mining machinery are backed by 28 years of manufacturing and application experience. Lippmann engineers are ready to help you, and a card or letter will bring prompt attention to your regular or special requirements. Lippmann Engineering Works, 4627 W. Mitchell St., Milwaukee 14, Wisconsin.



LEW LIPPMANN

CRUSHERS FEEDERS SCREENS CONVEYORS ELEVATORS HOPPERS BINS

Stearns

ELECTRO-MAGNETIC PULLEY
PROTECTS REDUCTION CRUSHERS

"pays for itself over and over"

HANDLING limestone for a large mid-western producer, this STEARNS Electro-Magnetic Pulley protects the reduction crushers by removing all tramp iron automatically, economically. If you want to reduce shut-down time and keep repair charges to a minimum — install a STEARNS Magnetic Pulley. It's the only economical and effective insurance against the tramp iron nuisance.

Whether your problem is the fairly simple job of tramp iron removal or the concentration and beneficiation of complex ores, STEARNS has EXPERIENCE ENGINEERED equipment to meet your specifications.

For a thorough investigation of your separation problem, STEARNS offers complete laboratory research facilities. Write today for details on testing of sample material.

ALL SIZES, ALL TYPES TO FIT YOUR NEEDS

Years of research and development by STEARNS engineers have produced an outstanding product in magnetic pulleys — the reason for the wide acceptance in all industries for removing tramp iron, for separation and reclamation of materials. For complete specifications and operating data, write for literature.

661 South 28th Street, Milwaukee 46, Wisconsin

### February Coal Exports Off

Overseas exports of coal during the month of February, 1952, totaled 3,147,115 gross tons, as compared with a total of 3,902,830 gross tons in January. The January figure was somewhat above the December, 1951, shipment of 3,731,192 gross tons. Forecasts that export of U. S. coal was leveling off came from several sources last month, as Western Europe continued its study of means to increase its own coal production. According to the American Association of Railroads, beginning with March shipments might be expected to run around 3,000,000 tons monthly for the remainder of the year. A prediction that Western Europe's imports of U. S. coal might drop as much as 5 million metric tons this year was voiced March 13 by John Brook, chairman of the coal committee of the United Nations Economic Commission for Europe. Mr. Brook, an official of the British Ministry of Fuel and Power, said that increasing coal production would lead to a "substantial decline in coal imports from outside Europe." According to reports, a special committee on coal production in Europe was expected late in March to submit a report to the Marshall Plan council concluding that Western Europe could become independent of U. S. coal by 1954 through greater productivity. In emphasizing greater productivity by miners now employed and the recruiting of more miners, from foreign countries as well, the committee urged attendance bonuses, exemption of miners from military service, better housing and larger investment in mine facilities.

### Progressives Ask Higher Wages And Welfare, Better Inspection

Progressive Mine Workers of America, meeting at their biennial scale convention in Springfield, Ill., last month passed a number of resolutions calling for higher wages and welfare and various other contract improvements. In one resolution, the PMWA asked that mines be inspected by a state mine inspector every 15 days, with rotation of inspectors. Other resolutions urged doubling of the $15 weekly sickness and injury benefits, increase of hospital and medical awards by 20% and lowering of the pension age from 62 to 60. Average pay boosts of 20% also were voted into the record.

### Central West Virginia Group Offers Scholarship Loans

A scholarship loan plan for students in mining engineering at West Virginia University has been established by the Central West Virginia Coal Mining Institute. The plan provides for annual loans of $500 each for a period of 4 yr, or a total of $2,000, to students who demonstrate good scholastic ability and require financial assistance to complete their education. The loans carry no interest charges and are to be repaid over a period of 4 yr following graduation. They are available only to students in Harrison, Tucker, Barbour, Randolph, Taylor and Upshur Counties.

# What's New in hydroseparators?

## THE DORR TYPE BW

***a rugged center-shaft mechanism in the 40 to 75' diameter range.***

Newest addition to the Dorr line of hydroseparators is the Type BW — a modification of the thoroughly proven and accepted Type H introduced several years ago. It is the *economical* answer to the problem of handling granular solids which do not warrant the use of the heavier Type H — but which are too heavy for a standard unit. Here are its major features...

**Power to spare when you need it** . . . through the BW's heavy-duty balanced worm and spur-gear drive.

**Positive overload protection** . . . by means of an automatic hydraulic lifting device activated by the torsional load on the mechanism. When an overload is encountered the rakes raise quickly — then lower slowly as the overload is reduced.

**Unique Center-Shaft Design** . . . combining an outer drive tube to which the pivoted drive rods are hinged and an inner lift tube which carries the rake arms.

**Free, center-cone discharge** — entire rake and drive mechanism is supported by a truss spanning the tank. Result . . . a clear center-cone area . . . providing unimpeded discharge of heavy solids.

The Type BW is available in diameters ranging from 40 to 75 feet. We'd like to tell you how it can fit into your picture economically . . . without obligation of course.

DOPACO

*Better tools TODAY to meet tomorrow's demand*

**DORR**

**WORLD - WIDE RESEARCH • ENGINEERING • EQUIPMENT**

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.

## COAL MEN ON THE JOB

**EASTERN COAL CORP., STONE, KY.:** E. F. Milen (left), superintendent; M. F. Rengers, shipping agent; C. A. Helms, electrical engineer; W. L. Meade, warehouse foreman; Algie Hughes, machine-shop foreman; and Estell Varney, warehouse clerk.

NEW METHOD...CHEAPER BULLDOZING

HINGED TEETH FOR BULLDOZERS WHICH RIP WHEN BACKING UP

PRECO *Back-Rip* SCARIFIERS

The 4 shanks, capped with lock-on teeth, rip the ground when tractor is backing up. Blade acts as depth gauge.

When tractor moves forward, teeth drag on top of ground. No controls are required.

Each tooth can be independently pinned up out of way. This permits making side cuts, trenches, curb locations.

Preco Back-Rippers, mounted on the back side of straight blade bulldozers, rip the ground while the tractor is backing up—for the next forward blading operation. They prepare the soil for easier blading by ripping rocks, roots and hard ground. The tractor produces more work with less horsepower—moving loose ripped material to the full capacity of the blade.

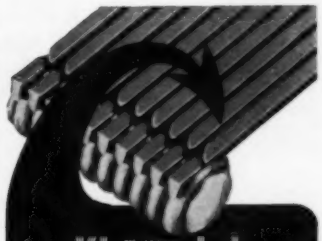
Preco Back-Rippers have been in use for the past three years by many well-known contracting firms. They save time and have replaced other equipment in building pioneer roads, clearing land and rights-of-way, in gravel pit operations, slate breaking in coal strip mines, mounted on pusher tractors for scraper loading, for logging operations and many other uses. Quickly installed on most straight blade bulldozers.

See your "Caterpillar" dealer or write us for information.

PRECO INCORPORATED


## 62 NEW PRODUCTS . . .

**OR CATALOGS are described in the Equipment News section. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs? The handy postage-free card facing p 124 will bring you more dope on any of them—without obligation. Just circle the numbers of the items that interest you, tear out card and mail.**

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PREPARATION SCREENS for SIZING · DEWATERING · SCREENING OR FILTERING APPLICATIONS

It is not necessary to change your present machine to accomodate our Vibrator Screens. The wedge shape of the screen wire with its non-clogging, non-blinding features permits perfect separation on wet or dry screening. The rigid construction adds considerably to the screens capability and efficiency. Proven in hundreds of installations.

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**Your assurance of Perfect Performance**

P-G

# Magnetic Reel Contactor

**All this . . . in a P-G Contactor**

- Easy to install.
- Affords control of reel motor with only a small toggle switch.
- Removes flashing arc from operator's hand.
- Spring opening of contacts.
- Adjustable terminals.
- Coil and contacts are interchangeable with P-G Automatic Transfer Switch.
- Rated at 5 H. P. at 250 volts D. C., 10 H. P. at 550.

**Type 48RM contactor** was designed primarily for use on mine locomotives for Reel Motor control. However, it may be used wherever remote control is desired of a circuit of appropriate rating and type.

***For further information, write for Bulletin #1300.***

P-G

**THE POST-GLOVER ELECTRIC COMPANY**

•ESTABLISHED 1892•

221 WEST THIRD STREET, CINCINNATI 2, OHIO

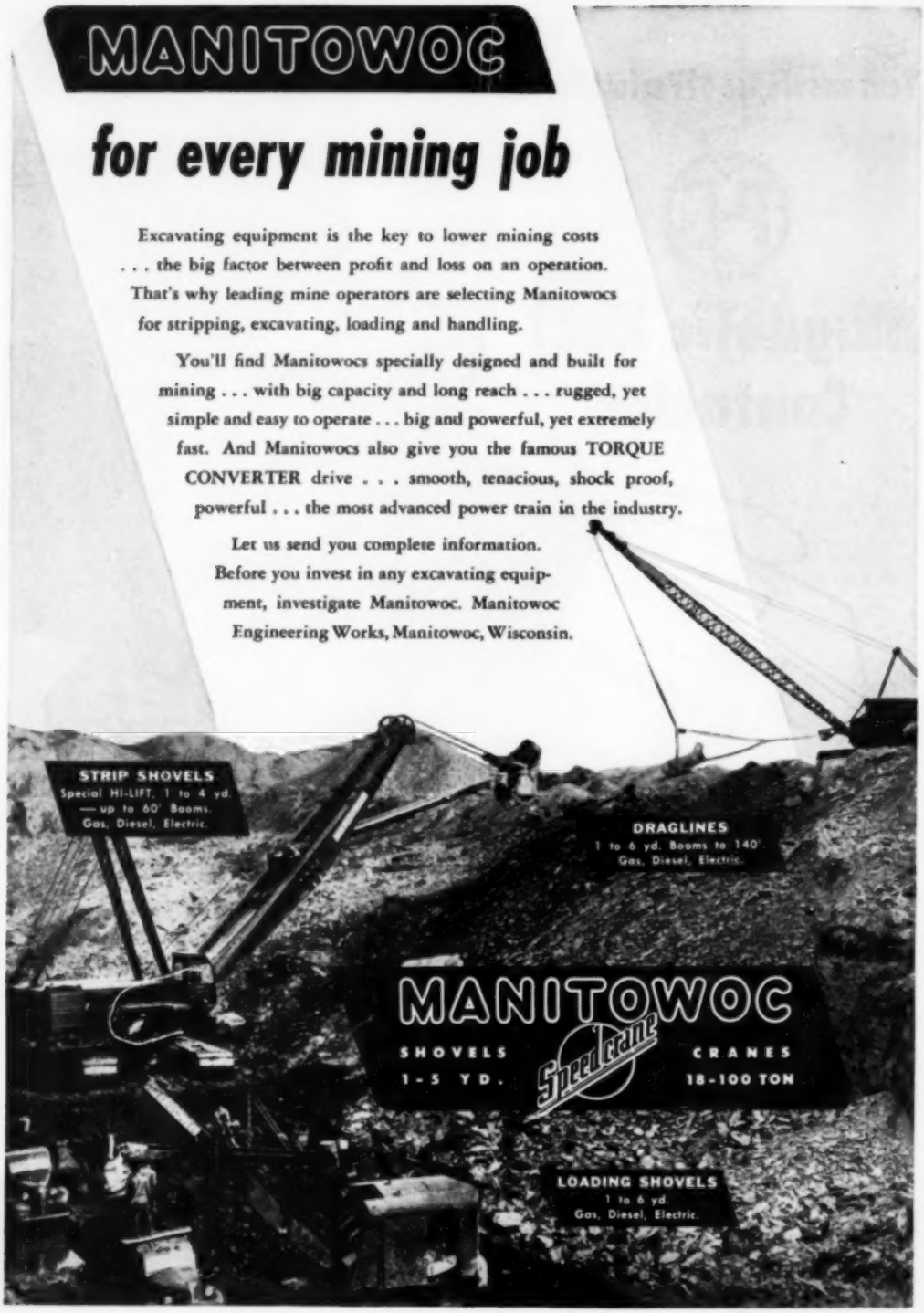
# MANITOWOC

## for every mining job

Excavating equipment is the key to lower mining costs . . . the big factor between profit and loss on an operation. That's why leading mine operators are selecting Manitowocs for stripping, excavating, loading and handling.

You'll find Manitowocs specially designed and built for mining . . . with big capacity and long reach . . . rugged, yet simple and easy to operate . . . big and powerful, yet extremely fast. And Manitowocs also give you the famous TORQUE CONVERTER drive . . . smooth, tenacious, shock proof, powerful . . . the most advanced power train in the industry.

Let us send you complete information. Before you invest in any excavating equipment, investigate Manitowoc. Manitowoc Engineering Works, Manitowoc, Wisconsin.



# Best Buy

## ...Here's Why!

**Aeroquip Detachable, Reusable Fittings** reduce hose line inventory. For on-the-spot replacements cut bulk hose to required length and attach fittings.

**Unique Fitting design** provides quick, easy assembly and assures positive grip on hose. No adjusting is required after assembly.

**Hose** is constructed of seamless synthetic rubber compound reinforced with two cotton braids and a high tensile steel wire braid.

**Wide range of male and female end fittings** in all sizes meet practically every requirement. Fittings are designed to SAE and JIC specifications.

**Tough, durable Aeroquip Hose Lines** are fire resistant. They perform satisfactorily at extreme temperatures—from —40° to +275° F.

**Aeroquip Hose Lines** are widely used with hydraulic fluids, lubricants, water, gasoline, Diesel fuel, air, and many other fluids.

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AEROQUIP FLEXIBLE HOSE LINES OUTSELL ALL OTHERS FOR INDUSTRIAL AND AIRCRAFT APPLICATIONS

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**AEROQUIP CORPORATION, JACKSON, MICHIGAN**

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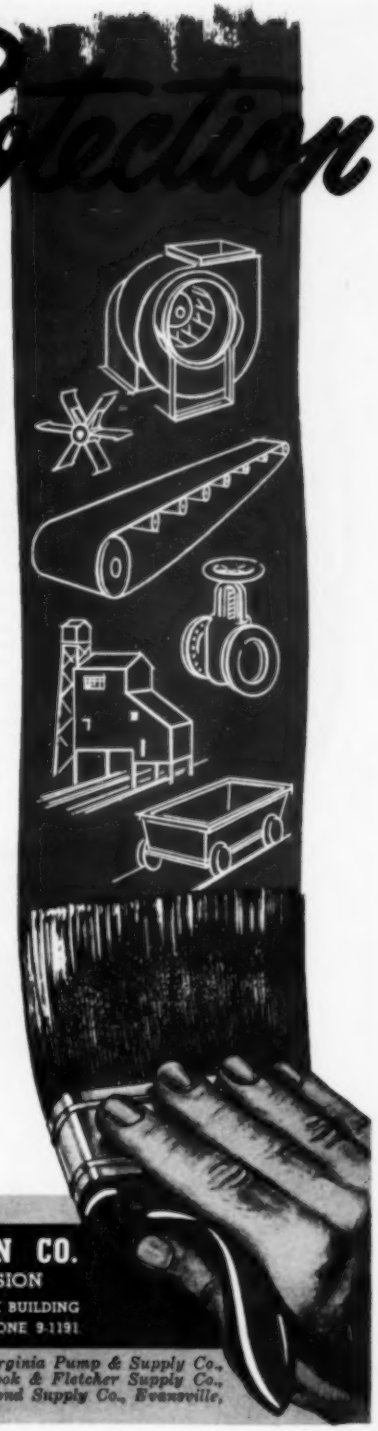
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

# Brush on Protection

**with**

## GACO LIQUID NEOPRENE COATINGS

**...for mining equipment**



### *adds life - cuts upkeep - saves time*

Here's the ideal maintenance and repair coating that can be quickly and easily applied by mine labor using an ordinary paint brush or spray gun! No heat—no pressure necessary—Neoprene air-cures in a jiffy and adheres to wood, metal, rubber or concrete providing an unbroken corrosion-proof film that protects vital equipment and surfaces from water, acid, oil and mildew. Neoprene Liquid Coating increases your safety factor as it is non-inflammable, an excellent insulator . . . will not chip nor peel and is highly abrasion resistant. Available in red, black and gray.

Investigate Neoprene Coatings further! Clip—sign—mail coupon NOW! You'll be glad you did!

THE CRICHTON COMPANY
JOHNSTOWN, PA.

*Send me, without obligation, detailed literature on Neoprene Liquid Maintenance Coatings.*

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EQUIPMENT DIVISION
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JOHNSTOWN, PA. •• PHONE 9-1191

*DISTRIBUTORS: West Virginia Pump & Supply Co., Huntington, W. Va. — Shook & Fletcher Supply Co., Birmingham, Ala. — Diamond Supply Co., Evansville, Ind.*

**...it's a TRANSITE PIPE mine drainage line!**

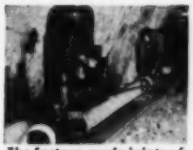
Carrying acid mine waters day in and day out is no problem for corrosion-resistant Transite Mine Service Pipe.

In many installations—some of them under corrosive conditions so severe that ordinary pipe failed in months—this asbestos-cement pipe has been in service for as long as 15 years—and *with no replacements!*

In addition to its long-term economies this pipe has many practical advantages that make it ideal for mine service. Tough and strong, it won't deform in use. Yet it is light in weight and easily installed. It is quickly coupled together, even in restricted mine passages—can be laid around curves or obstructions without special fittings. Its tight joints stay tight in service.

Available for working pressures up to 150 lbs. per sq. in. and in a full range of sizes, Transite is the money-saving pipe for many mine service requirements, including drainage lines, water supply lines, etc. For further information, write for Brochure TR-51A. Address Johns-Manville, Box 60, New York 16, N.Y.

Transite is a Johns-Manville registered trade mark



The factory-made joints of Transite Mine Service Pipe are assembled with a simple coupling puller.

Curves present no problem with Transite Mine Service Pipe. Deflections up to 5° can be made at each joint.

Tough, strong asbestos fibres help give Transite Mine Service Pipe many of its outstanding qualities.

Johns-Manville
TRANSITE *mine service* PIPE

## Canadian Miners Get Pay Hike

Some 12,000 Nova Scotia coal miners are affected under the new contract providing a wage boost of $1 a day signed by the Dominion Steel & Coal Corp. and the United Mine Workers (CCL) District 26. The new agreement raises the basic daily rate to $9.74 and provides for four paid statutory holidays a year. The miners originally had asked for a daily increase of $3.26. The contract also calls for reconsideration of wages after every three-point increase on the cost-of-living index. Coal prices were increased $1 a ton as a result of the new wage scale, it was reported. In British Columbia, coal prices were increased from 35c to $1.75 a ton following wage hikes granted miners in British Columbia and Alberta.

## UMWA Fund Sues Companies For Royalty Payments

Trustees of the UMWA Welfare and Retirement Fund entered suit March 12 against the Low Moisture Coal Co., Providence, Ky., for $15,601.40. The money was for royalty payments due on coal mined under the wage contract since October, 1948, the trustees maintained. In Pennsylvania, the Fund was awarded a $5,587 verdict last month by a federal court jury against the Guseman Bros. Coal Co., Uniontown, Pa. The trustees had sued the company for $8,373 in royalties due under the 1947 contract.

## Kentucky Stripping Bill Appears Blocked

An administration-supported bill to regulate and control strip mining in Kentucky appeared to be blocked in the state Senate unless compromise action could be effected, it was reported March 12. The bill, which was backed by Gov. Wetherby, was held in the Senate Rules Committee which refused to report it out. The bill reportedly was opposed by Lt. Gov. Emerson Beauchamp, who also is chairman of the rules committee. At present, Kentucky has no law regulating strip mining. The current bill is identical to a measure proposed during the 1950 session of the legislature. A revised version of that bill was defeated by one vote in the Senate in 1950.

## British Miners Hit Budget; Ask Increased Wages

Leaders of the National Union of Mine Workers, representing Britain's 700,000 coal miners, at a meeting in London March 14, struck vigorously at the Conservative Government's new budget, calling it "an affront to the people and tantamount to a reduction in wages." The conference demanded "increases in wages . . . to offset the effects of this budget on our members' living standards." Delegates attending the meeting also voted by a slim margin to continue Saturday work in an effort to bolster coal output, with the provision that there would be a respite during the summer unless miners voted otherwise.

# Safety | at ~~any~~ low cost

Safety doesn't have to be expensive. Many operators have found that Armco Liner Plates not only make safer portals, shafts and tunnels but also help keep costs down.

Efficient, corrugated metal design provides ample strength yet keeps weight and bulk down. Corrugations continue through the lapped joints and bolt holes are staggered to assure conduits of uniform strength.

Other advantages include fire-resistance and long, dependable service with little maintenance.

Costs are low because Armco Liner Plates are simple to install. One man can carry, hold and bolt a section into place using only a hand wrench. Less bulk means less excavation, smaller storage space. The wide range of sizes and gages also saves you money. You select exactly what you need to most economically meet your specific requirements.

You'll find Armco Liner Plates ideal for safe, low-cost portals, overcasts, shafts, haulways and relining jobs. Ask someone who has tried them and write for complete information.

Armco Drainage & Metal Products, Inc., 2442 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

Armco Liner Plates

ARMCO

## And For Your Information . . .

**Full-scale shipping operations** on the Great Lakes may begin this year as early as April 3, the weather bureau has predicted.

**The Lorain Coal & Dock Co.** recently presented $3,000 honor insurance certificates to 11 employees who have had perfect attendance records since the company's distinguished service plan was put into effect Jan. 1, 1943. Some of the men had even longer records of perfect attendance, the company reported.

**Short-weighting six coal customers** was blamed on television by a London, Eng., coal dealer who was hailed into court last month. The men filling the sacks did it hurriedly, he maintained, because they had accepted an invitation from a housewife customer to watch the King's funeral procession on her television set. The dealer was fined the equivalent of $25.20.

**The Baltimore & Ohio Ry.** celebrated its 125th anniversary Feb. 28 with ceremonies in Baltimore. March 27th, the road reported, marks the 104th anniversary of the running of the first regularly scheduled night-time passenger train in the United States, from Cumberland, Md., to Baltimore. The B. & O. expects to spend some $52,000,000 for improvements and new equipment in 1952, providing funds are available. Plans call for spending of $17 million for new diesel power totaling 99 units; $23,400,000 for 3,500 hopper cars and 1,000 boxcars; and $10 million for road improvements, including completion of the new $4-million tunnel on the mainline near Clarksburg, W. Va., started in 1950.

**Atomic energy for production of electric power** is being investigated in joint experiments undertaken by the Detroit Edison Co. and the Dow Chemical Co., it was reported March 19. Actual use of atomic energy for power generation is several years away, Prentiss M. Brown, chairman of Detroit Edison, told stockholders.

**The glamour of coal mining** is dramatically illustrated in a new large-size booklet issued by the West Kentucky Coal Co., Madisonville, Ky. Entitled "Enjoying Life—West Kentucky Coal Co.'s Share in the American Way of Living," the book is beautifully illustrated with 4-color paintings by Grant Reynard. Emphasizing the company's philosophy and the benefits of living in the area, the book "tells an unusual story about the West Kentucky Coal Co., but it speaks also for America's revolutionary and amazing coal industry."

**The UMWA Local in Royalton, Ill.,** is making tentative plans to form a cooperative and re-open the former Franklin County Coal Corp. mine closed last fall and sold to the Woosley Equipment & Salvage Co., it was reported March 20. The plan is yet to be approved by district and international officials of the union.

# BACKBONE

## of the Four Trackless Mining Units at **LIDA B** Mine

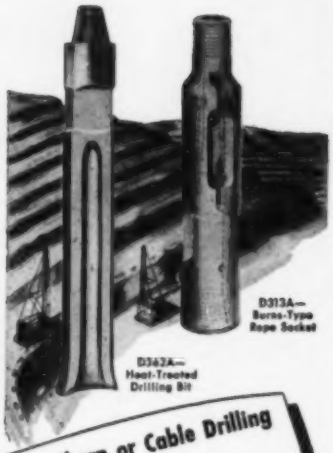
# CLARKSON *Redbird*

## Type 28FA Universal RUBBER-TIRED LOADING MACHINES help maintain average production

Efficiency-engineered to reflect a daily output of 40 to 50 tons per faceman—it is significant that the Lida B Mine should depend on Clarkson Redbirds to maintain production. Here are a few of the reasons:

- Front and rear conveyors flex horizontally and vertically with fingertip push-button controls. Front head and chassis both swing to permit closer work around face timbers.
- Only one 50 H. P. motor . . . no differential.
- Front head raises and lowers 26" above floor line and 18" below floor line.
- The *only* completely mobile face loader on rubber tires.

*The* CLARKSON
MANUFACTURING CO.
*Nashville*
*Illinois*

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of
• BLAST HOLES
• PROSPECT HOLES
• SAMPLING
SAFE • EFFICIENT • ECONOMICAL

Spang Churn or Cable Tools are top performers in their fields for drilling test holes when prospecting or sampling . . . drilling blast holes for fragmentation of minerals or overburden . . . drilling and reaming escape, dewatering and ventilating holes . . . and drilling wells for other purposes. Fifty years' experience serving oil, water-well, mining and quarrying operations assures their value.

D604—Reamer-Type
Pilot Bit

LARGE BITS
for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.

D370F—Prefabricated
Star Bit

SPANG CABLE TOOLS
SPANG & CO., BUTLER, PA.
for
• SHOT BLAST HOLES • WELL DRILLING
• PROSPECT HOLES • SAMPLING

# Among the Manufacturers

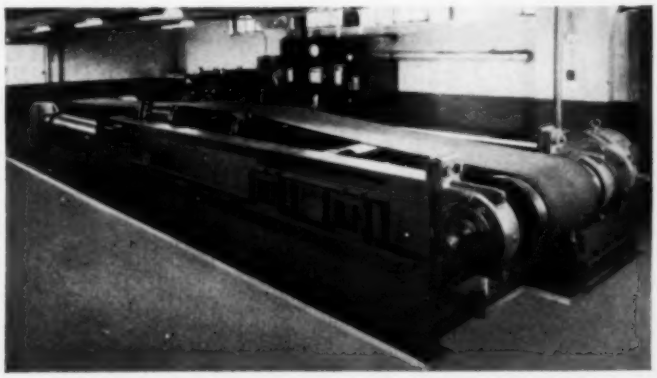
**National Mine Service Co.** has promoted W. C. Campbell from manager, Joy Div., Beckley, W. Va., to manager, mining sales, Whiteman Div., Indiana, Pa. Mr. Campbell has been succeeded in Beckley by W. J. Noel, and Mr. Noel, in turn, has been succeeded by Sterling T. Nicholls as office manager of the Joy Div. J. L. Gabri has been appointed sales engineer in charge of the promotion and sale of Hayden belt-fastening equipment and Neo-Clad products. William Ward, formerly purchasing agent, Imperial Smokeless Coal Co., Quinwood, W. Va., has joined National Mine Service as a sales representative, with headquarters at the All-State Div., Logan, W. Va.

**McNally Pittsburg Mfg. Corp.**, Pittsburg, Kan., has announced the addition of Colin P. Holmes, English coal-preparation expert, to its engineering advisory staff. Mr. Holmes, former head of coal-preparation activities for Birtley Co., Ltd., Newcastle, Eng., will serve the McNally Pittsburg organization in an advisory capacity as preparation consultant on flotation equipment and other coal-preparation activities. During the last war, Mr. Holmes served on the directorate of open-cast coal production of the Ministry of Works of England and much of his broad experience has been gained in Continental as well as English coal production.

**J. R. Lewis** has been named general sales manager, Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia. Mr. Lewis, who has been with Quaker more than 11 yr, has successively been Philadelphia district sales manager, assistant sales manager and assistant general sales manager. To provide better service and deliveries to the growing St. Louis industrial area, Quaker Rubber has established a stock-carrying branch warehouse and sales office at 4006 Papin St., St. Louis, Mo., it was also announced last month. The new branch will operate under the supervision of J. H. Joyner, district sales manager.

**Jack Donahoe** has joined Long Super Mine Car Co., Inc., Oak Hill, W. Va., as sales engineer. A native of West Virginia, Mr. Donahoe prior to World War II was employed by The New River Co. Before joining the Long organization, he was manager of the Donahoe Electric Co.

**Tool Steel Gear & Pinion Co.**, Cincinnati, has announced extensive changes in its top management. Leroy Brooks Jr. has been elected chairman of the board and has been succeeded as president by LeRoy R. Brooks, formerly vice president and secretary. Sanford M. Brooks has been advanced from vice president and treasurer to executive vice president. C. R. Burrell has been named vice president in charge of sales and has been succeeded as general sales manager by John C. Seeger, previously assistant general sales manager. Harry M. Hopkins, formerly works manager, has been made vice president in charge of operations, and John J. Stolz, chief engineer, has



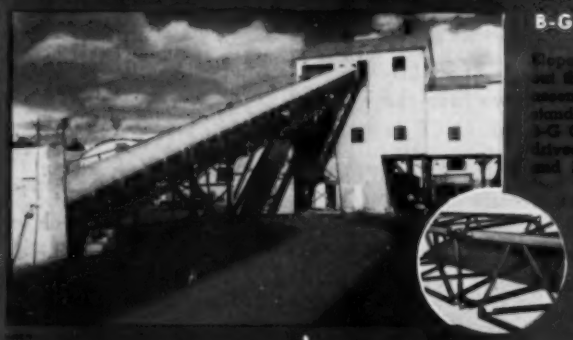
## Conveyor Tester Duplicates Operating Conditions

**BILLED AS THE WORLD'S LARGEST,** this testing machine now operating at the Passaic, N. J., laboratory of Raybestos-Manhattan, Inc., Manhattan Rubber Div., is expected to take the guess out of conveyor-belt manufacture by eliminating a measure of trial and error in design of conveyors of unusual requirements. Reportedly the first of its kind, the machine tests any 30-in wide 80-ft length of conveyor belt up to 200,000-lb tension and duplicates actual arrangement of head, snub, bend, takeup and tail pulleys with adjustable angle and elevation of troughing idler pulleys. Automatic recorders simultaneously trace power input, stretch, tension and speed at any speed up to 2,000 fpm.

# Barber-Greene

## B-G MINE CONVEYOR SYSTEMS FROM ROOMNECK TO TIPPLE

Made up of standard, interchangeable "packaged" components, eliminate "special" engineering. Complete installations made by simply putting together proper combination of ready assembled frames, supports, take-ups, etc.

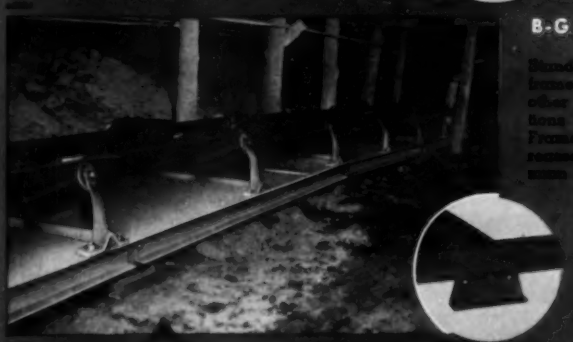


### B-G SLOPE CONVEYORS

Slope conveyors to meet every requirement—without the expense of special engineering or costly assembly—are available by combining the proper standardized permanent conveyor, factory aligned B-G Conveyor "packages." Frames, carriers, drives, take-ups, walkways, housings. A frames and hoppers—are all delivered clearly marked for easy erection. There is maximum flexibility in B-G design which enables you to lengthen, shorten or reassemble your B-G Slope Conveyor at different locations with 100% salvage.

### B-G MAIN ENTRY BELT CONVEYORS

Made up of self-contained, interchangeable sections, these conveyors are widely preferred for collecting from several panel conveyors, conveying to tipple, railroad cars, standard mine cars, slope conveyor, etc. For such permanent or semi-permanent services, Main Entry Belt Conveyors are built according to heavy-duty mining standards with large carriers, heavy drives, section frames of sturdy structural channel steel with welded steel supports. Standardized sectional construction simplifies transport of the unit to the location, speeds up installation. Note in photo at left how decking plates are bolted to the frame to fully protect the return belt.



### B-G PANEL BELT CONVEYORS

Standardized design allows the selection of panel frame units suited to head room, lump size and other pertinent conditions. For fast retreat operations or in fast moving panel work, B-G Panel Frame units are easy to install, knock down or reassemble. Couplings are designed for maximum rigidity; sections are easily aligned, built to withstand heavy impact; adaptable to lowest head room operations.

Write for complete information about the Barber-Greene line of coal handling conveyors—including special conveyors for barge loading, track loading and stockpiling.

B-G **Barber-Greene Company**

# EXPERIENCE QUALITY SERVICE

• Since we have been REPAIRING & REBUILDING mining equipment since 1910, we have the KNOW-HOW. Let us use this EXPERIENCE to help you.

The finest materials and expert workmanship combined with our knowledge of your needs make our COILS and BRASSES the best in the field. Get the most for your money by using our CUSTOM BUILT parts for mining machines.

We maintain eight repair shops with well-stocked warehouses in order to serve you quickly and efficiently.

*Manufacturers of:*

**ARMATURE COILS—FIELD COILS—BRASSES**
**JOURNAL BOXES—REPLACEMENT PARTS FOR MINING MACHINERY AND LOCOMOTIVES**

**WEST VIRGINIA ARMATURE CO.**
**Bluefield & Williamson**
**WEST VIRGINIA**

McDOWELL ARMATURE & MACHINE WORKS, WELCH, WEST VA.
MINE SUPPLIES, INC., MONTGOMERY, WEST VA.
AMERICAN ARMATURE & ENGINEERING CO., MULLENS, WEST VA.
KENTUCKY-WEST VIRGINIA ARMATURE CO., WHITESBURG, KY.
CENTRAL ELECTRIC REPAIR CO., FAIRMONT, WEST VA.
SERVICE MACHINE & ELECTRIC CO., GRUNDY, VA.


been named assistant vice president in charge of engineering. N. C. Strohmenger, formerly chief metallurgical engineer, has been advanced to assistant vice president in charge of metallurgy. Stanley Woodward, formerly assistant secretary, has been elected treasurer.

**Phillips Mine & Mill Supply Co.**, Pittsburgh, has announced four changes in its top management. John M. Phillips, Sr., formerly president of the company, was advanced to chairman of the board. John M. Phillips Jr., formerly vice president and general manager, was elected president. James M. Phillips has been made vice president and general manager. D. A. Beck, also named a vice president, will direct purchases and serve as assistant secretary-treasurer.

**Kennametal, Inc.**, Latrobe, Pa., has appointed Dale Christopher and Jack Begley as representatives. Mr. Begley, a graduate in mining engineering from the University of Kentucky, will cover the territory of Southern West Virginia, Western Virginia and Eastern Tennessee. Mr. Christopher, formerly sales engineer with Duff-Norton and Ensign Electric, will cover Northern West Virginia.

**Macwhyte Co.**, Kenosha, Wis., has elected George C. Wilder vice president and assistant general manager. Mr. Wilder joined the company in 1938 and has served as assistant to the general manager since 1949.

**Axeman-Anderson Co.**, Williamsport, Pa., has acquired the Anthratube boiler-burner division of Bethlehem Foundry & Machine Co., Bethlehem, Pa. Manufacture of the Bethlehem unit will be discontinued and no part of it will be incorporated in the design and manufacture of the Axeman-Anderson Anthratube, the company reports. It will, however, maintain parts and service for Bethlehem units now in operation. Since the introduction of its unit, Axeman-Anderson has continued extensive development and improvement on the Anthratube and offers two models, a household size and a later larger unit for institutional and commercial uses.

**Carl A. Salmonsen** has been appointed general manager of the General Electric Co.'s newly-formed Industry Control Dept., which will be a component of the Switchgear and Control Div., with headquarters in Schenectady. Mr. Salmonsen, a G-E employee for more than 42 yr, has been manager of manufacturing of the company's former Large Apparatus Div. William L. Rodich, formerly assistant general manager, has been promoted to general manager of the laminated and insulating products department of General Electric's Chemical Div., with headquarters in Coshocton, Ohio. Prior to joining G-E in 1950, he was superintendent of manufacturing for S. B. Penick & Co.

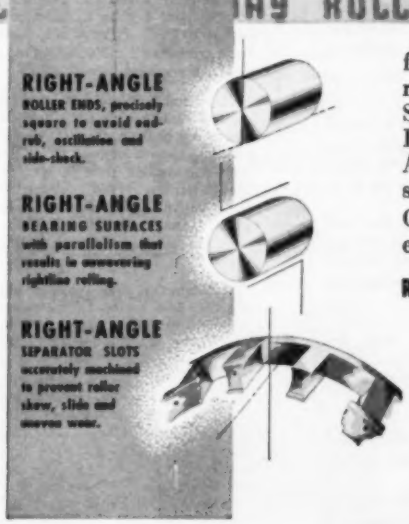
**Roy C. Heacock** has been promoted to chief engineer in charge of development and engineering, Barber-Greene Co., Aurora, Ill. Mr. Heacock joined the company 6 yr ago and until his current

# In-Built Trueness...

## *basis for longer life and lower cost!*

Unwavering right-line rotation . . . that's the immediate result of in-built trueness in Rollway roller bearings. There's no skew, no side-shock, no roller-end-drag. Internal forces are balanced by matchless precision in related parts. Bores are precisely cylindrical. Separator surfaces are rigorously parallel. Roller ends are truly square on every diameter. And bearing surfaces match both the separator slots and the roller races.

Over the long run, life expectancy is greatly extended. Cost per unit of time falls sharply.


RIGHT-ANGLE
ROLLER ENDS, precisely square to avoid end-rub, oscillation and side-shock.
RIGHT-ANGLE
BEARING SURFACES with parallelism that results in unwavering rightline rolling.
RIGHT-ANGLE
SEPARATOR SLOTS accurately machined to prevent roller skew, slide and uneven wear.

**Rollways Roll Right Because They're Made Right**

Let our engineers help you to select the Rollway bearing that is exactly right for your application. Our years of specialized bearing experience and complete engineering and metallurgical service are always at your command. No cost. No obligation.

**Nationwide Replacement Service:** Rollway bearings are available for replacement through authorized bearing distributors in principal cities. To locate, consult classified 'phone directories under BEARINGS. Rollway Bearing Co., Inc., Syracuse 4, N.Y.

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| SYRACUSE | DETROIT |
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**ROLLWAY BEARINGS**

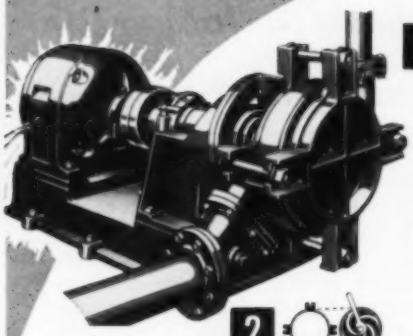
Complete Line of Radial and Thrust Cylindrical Roller Bearings

Morris

Type R Slurry Pump

Gives Longer Service, Less Trouble

because



1

No internal studs or bolts — no troublesome internal joints and fits. Suction Disc Liner is merely *clamped* into position between disc and shell. Fewer wearing parts mean less maintenance and longer uninterrupted service.

2

Impeller and shaft sleeve of the Morris Type-R Slurry Pump can be renewed *without disturbing* the suction and discharge piping or the bearings. This means considerably less lay-up time.

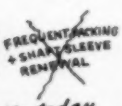
3

Due to the clamping effect of the bolts on the discs, the shell is not subject to high stress. Consequently, the shell can be made of a wide variety of materials, including those of high abrasive resistance. Yet these materials need not necessarily be of high tensile strength.

4

Hydraulic passages of the suction discs are extremely large and velocities are low. As a result, wear is minimized and renewal infrequent.

5




Stuffing box troubles are practically eliminated because the suction gland is under low suction pressure only.

*Write today for free bulletin*

Practical information in Bulletin No. 181 shows by performance curves just how the Morris Type-R Slurry Pump fits specific operations . . . describes exclusive construction features that cut operating costs.

**FOR MINING OPERATIONS**

Morris Type-R Slurry Pump handles all types of mixtures, including abrasive solids and acid slurries and sludges.

**MORRIS MACHINE WORKS**

Baldwinsville, N. Y.

Branch Offices in Principal Cities

MORRIS *Centrifugal Pumps*


**COAL MEN ON THE JOB**

**KENTUCKY:** O. L. Risner (left), district mine inspector, Kentucky Department of Mines and Minerals; and J. N. Stewart, chief electrician, Grayson Block Mining Co., Grayson, Ky.

promotion was executive engineer of engineering development.

**Donald B. Stroud,** sales engineer of the Reliance Electric & Engineering Co. for the past 4 yr at the company's Cincinnati, Ohio, district sales office, has been transferred to Indianapolis, Ind., as resident engineer.

**Raymond S. Wood** has been appointed general manager of Link-Belt Co.'s ball and roller bearing plant (Dodge plant) in Indianapolis, to succeed C. V. Loughery who has retired after 50 yr of service. Mr. Wood has served as district manager for positive drive sales at Detroit; as plant manager at Minneapolis; and as assistant general manager of the Dodge plant since 1950.

**Cummins Diesel Sales Corp.,** Des Moines, is the new Cummins sales and service outlet for eastern and central Iowa, with the exception of Scott County. The new facilities will operate as a branch of the Omaha office with James M. Gleason, former senior salesman at the Cummins Chicago dealership, as acting branch manager. L. H. Hanlon is in charge of the office and parts department, and Joseph Boston heads the service department. John T. Weber has been named manager, sales development, Cummins Engine Co., Inc., Columbus, Ind., succeeding Howard P. Sharp, resigned. Mr. Weber joined the Cummins organization in 1947 and formerly was assistant to the controller.

**Dale D. Spoor,** former chief of the Industries Branch of the Metalworking Equipment Div., NPA, has been appointed manager of the equipment and process sales department, Air Reduction Sales Co., New York. Mr. Spoor has served in various capacities in the Airco organization and in 1948 was appointed manager of the newly formed equipment sales department, from which he was

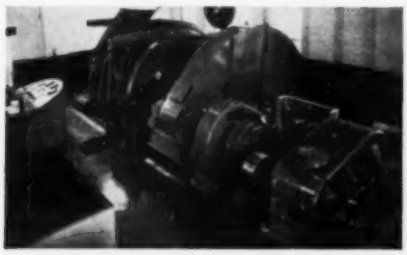
# *Reliable* EQUIPMENT IS AS VITAL TO THE COAL INDUSTRY AS COAL ITSELF...

# HOLMES MINING EQUIPMENT

The hundreds of mines using equipment engineered and built by Holmes, is a testimonial that they have been *doing one thing well* since 1872. Use this specialized experience to obtain the most advanced design, the best of materials and the latest methods of manufacture. Take advantage of this background of creative engineering and long-standing reputation for sturdy construction that assures efficient, dependable performance at lower over-all costs. Call a Holmes Mine Equipment engineer for consultation in the planning and development of your requirements. There is no obligation.

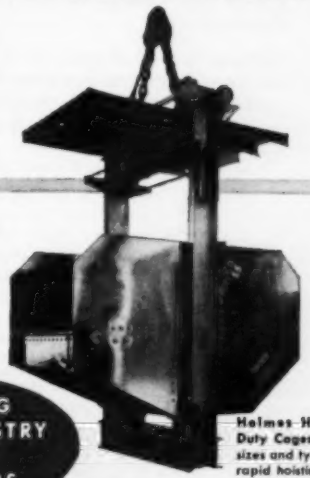
**ROBERT HOLMES & BROS., INC.**
DANVILLE, ILLINOIS

**Holmes Lowering Spirals** gently lower and deposit materials on the peak of the pile in bulk storage bins, eliminating degradation. Write for complete information.



**Advance Design Hoists** feature the latest and most complete control equipment. Ask for complete information.

SERVING THE INDUSTRY FOR 80 YEARS



**Holmes Heavy-Duty Cages** in all sizes and types for rapid hoisting and low maintenance. Ask for complete information.

SHEAVES

TIPPLE EQUIPMENT

CAGES

SKIPS

LOWERING SPIRALS

CAR PULLERS AND RETARDERS

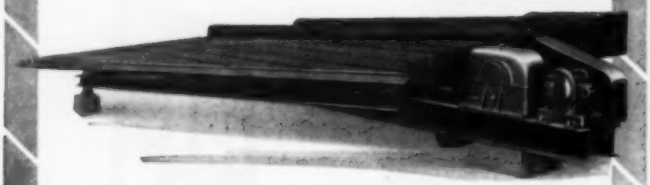
LABORATORY CRUSHERS

HOISTS

VIBRATING SCREENS

DUSTOLATORS

# Tested and Proved



The SuperDuty Diagonal Deck Coal Washing Table is the most highly perfected apparatus available today for cleaning of fine sizes. Continually modernized to meet tomorrow's demands, its mechanical and performance fundamentals have been proved by substantial years of successful, hard service in the field. Functional accuracy of the Diagonal Deck, operating smoothness of the Anti-Friction Bearing Head Motion, and overall stability through the Factory-Aligned Underconstruction . . . these are all features that have been successfully combined and balanced to assure a generous working margin over rated performance standards.

For quality washed products in the fine coal fractions, the SuperDuty thus leads the field with capacity and performance standards that can be checked and double checked in hundreds of installations. Write for Bulletin 119.

**CONCENCO FEED DISTRIBUTOR**

The Concenco Revolving Feed Distributor is a heavily fabricated all steel machine with motor drive requiring 1 H.P. or less in operation. It effectively provides a splitting of feed into any desired number of equal portions, to serve any number of circuits or machines in battery for greater overall efficiency. Unexcelled for feeding concentrating tables.

THE DEISTER ★
CONCENTRATOR
COMPANY
901 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*


granted a leave of absence in March, 1951, to serve in Washington.

**Borg-Warner Corp.** has announced establishment of a Products Development Laboratory in Detroit, as a separate division for carrying both defense and civilian items from the invention stage to actual production. The development of new products for war use and the improvement of automatic transmissions are the projects which are being given priority by the staff of more than 50 engineers, designers and other technicians under the direction of David T. Sicklesteel, newly appointed general manager of the laboratory. The Ingersoll Products Div. of Borg-Warner has appointed Thur Schmidt as director of research and development for the division. He formerly was assistant to the president.

**Union Wire Rope Corp.,** Kansas City, Mo., has appointed Harold H. Musselman a representative for Missouri and Kansas.

## New Books for Coal Men

### Better Welding

**Modern Arc Welding.** Here's a book for welding operators, designers, practicing engineers and students. It tells how electric arc welding developed and describes applications, available metals and alloys, joints and welds, equipment and basic procedures. It includes a self-study course and a glossary of terms and definition. *544 pp. 600 illustrations. $3, Hobart Trade School, Hobart Square, Troy, N. Y.*

### Telling the Facts

**Talking It Over With Employees, Stockholders and Dealers.** If you want new ideas about what to tell your workers, stockholders and dealers, this booklet may help you. It also will show you how to get your message across. Though the booklet was prepared with the small company in mind, its usefulness extends to big companies as well. There are sample materials to guide you, plus a calendar suggesting ideas for each week of the year. *60 pp. 8½x11-in. Spiral-bound. One copy free; 2 to 99 copies, 30c each; 100 copies or more, 25c each. Industrial Relations Div., National Assn. of Manufacturers, 11 West 49th St., New York 20, N. Y.*

*The three following publications by the Bureau of Mines are available at the price quoted from the Supt. of Documents, Government Printing Office, Washington 25, D. C. All are 6x9-in; paper.*

**Limits of Flammability of Gases and Vapors,** by H. F. Coward and G. W. Jones. USBM Bulletin 503. 40c.

**Carbonizing Properties: British Columbia, Matanuska Valley (Alaska) and Washington Coals and Blends of Six of Them With Lower Sunnyside (Utah) Coals,** by J. D. Davis, D. A. Reynolds, B. W. Naugle, D. E. Wolfson, G. H.

## ..Good MACHINES BACKED BY A Good COMPANY NAME

Men and corporations in the excavating or material handling business today need the very best, most efficient tools they can get.

They need a good name behind their equipment, too, for maintenance and service are a real, inevitable part of our mechanical age.

How GOOD can a machine be? MARION, since 1884, has tried to build the best machines possible within the limits of being practical. Not the cheapest machines, but the best. Not to meet a price, but to do a job.

Any MARION representative can show you how this policy has paid dividends for owners throughout the world in terms of dependable, profitable work over long periods of time.

The thousands of MARION machines in service today and the good friends MARION has in many important industries have helped strengthen our convictions that there will always be a market for machines backed by a good company name.

*Write for a copy of our new catalog, No. 403, giving condensed specifications on the complete line of MARION machines.*

**MARION**

POWER SHOVEL COMPANY

MARION, OHIO, U.S.A.

# CONTROLLED TIMER

*at a price you can afford*

PRE-SET, TAMPER-PROOF TIMING

Practically non-breakable, Durakool Pre-set Timer Relays have more than proved themselves on the roughest and toughest jobs that could be found. Year by year, their use increases in sensational fashion. Controlled time available from .15 to 20.0 seconds in either normally open or normally closed actions. 3 to 4 week delivery. No waiting. Your production schedule is met.

- ★ No false contacts
- ★ No chatter
- ★ Quiet in operation
- ★ Eliminates double contacting or breaking of circuit

See telephone directory for local distributor or write

DURAKOOL, INC., Elkhart, Ind.

**Durakool**

ALL-STEEL MERCURY *Timers*


Gibson, R. E. Brewer and G. W. Birge. USBM Bulletin 510. 40c.

**Carbonizing Properties: Eastern Kentucky Coals from Elkhorn No. 1, Elkhorn No. 2, Leatherwood and Harlan Beds,** by J. D. Davis, D. A. Reynolds, D. E. Wolfson, B. W. Naugle, W. H. Frederic, R. E. Brewer and G. W. Birge. USBM Bulletin 511. 25c.

## And For Your Information . . .

**Some 600 anthracite** and automatic-stoker dealers in the Northeastern states and Canada have had the advantages of weather reports from a well-known meteorologist this winter to help them anticipate home consumption of anthracite, time deliveries to protect customers and plan their buying and advertising. The forecasts, supplied by Electric Furnace-Man, Inc., Emmaus, Pa., are issued monthly, with emergency bulletins on anticipated storms 48 hr in advance.

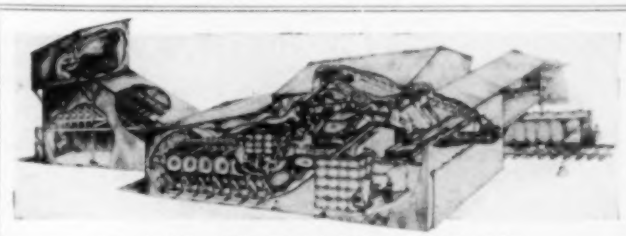
**Walter F. Schulten,** vice president of Pittsburgh Consolidation Coal Co., was doubly honored in one week last month. On one day, he was elected president of the Rotary Club of Pittsburgh and on the following day was elected vice chairman of the executive committee of the Allegheny Regional Advisory Board.

**MINING MEN by the thousands look to COAL AGE for good "Operating Ideas." Why not let us print yours, at regular rates? See p. 106.**

## COAL MEN ON THE JOB

**WEST VIRGINIA:** E. F. Smith, superintendent, Coal Mountain mines, Red Jacket Coal Corp.

**Two new sales aids** for development of anthracite sales have been reported by the Lehigh Navigation Coal Co. The company has inaugurated a new house organ which is being designed to present vital facts on modern methods of merchandising anthracite to coal dealers in the anthracite area. The company also is beginning a new policy of providing dealers with two completely new campaigns a year.

. . . a typical example of a coal cleaning plant designed by:

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So it's worth remembering, America's coal industry is the world's most efficient . . . America's vast coal reserves assure plentiful heat, light, power for centuries!

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- ☆ **Labor costs are cut with modern boilers and automatic handling equipment!**
- ☆ **Easiest and safest to store *of all fuels!***
- ☆ **America's vast reserves make coal's supply always dependable!**
- ☆ **Dependable supply assures price stability!**
- ☆ **A progressive industry strives constantly to deliver an ever better product at the lowest possible price!**

**BITUMINOUS COAL INSTITUTE**
**A Department of National Coal Association, Washington, D. C.**

**FOR ECONOMY AND DEPENDABILITY**

# *YOU CAN COUNT ON COAL!*

## AIME Coal Division Meets

**Begins on page 140**

Shen-Penn's electrical superintendent said in describing his company's power system designed for safer, more efficient strip mining. Features of the power system are impedance grounding, capacitor power-factor correction, portable secondary substations and control centers, and modern protective equipment at all points. Services include a portable splicing unit for repairing cables in the field, a cable tester by which all cables are examined at definite intervals, and strict maintenance records on all pieces of equipment.

Production roof-bolting with rotary drills, underground auger mining and a comparison of continuous and individual splitting were subjects at the Monday afternoon session, J. A. Younkins, Duquesne Light Co., Pittsburgh, Pa., and J. F. Core, United States Steel Co., Uniontown, Pa., presiding.

The advantages of rotary drilling for roof-bolting are becoming increasingly evident and it is expected that rotary drilling will become more widely used, was the view expressed by A. F. Kain, Joy Mfg. Co., Pittsburgh, Pa., in his survey of rotary-drilling units and the results obtained with them in actual practice. Noting that the observed drilling units could not be compared with regard to effectiveness because of differences in the conditions under which they operated, Mr. Kain presented performance data for certain types, as follows: three men using a hand-pulled drilling unit in the 40-in Sewell seam (W. Va.) place eight bolts in 90.5 man-minutes, two men using a self-propelled rotary drill in the No. 2 Gas seam (W. Va.) place seven 42-in bolts in 37.2 man-minutes, and two men using a self-propelled rotary drilling unit in the Ohio No. 6 seam place 12 42-in bolts in 56.5 man-minutes.

Rotary drills for roof-bolting will minimize the problems of dust control, operator fatigue and maintenance near the face of extra units, such as air compressors, Mr. Kain said.

In reporting the results of experiments with an underground auger, R. W. Storey, Consolidation Coal Co. (Ky.), Div. Pittsburgh Consolidation Coal Co., Jenkins, Ky., stated that in drilling 25-in-diameter holes a production of 66.6 tons per machine shift should be realized with two men operating the machine. In describing two projected systems for auger mining, Mr. Storey said that augers appear to have definite possibilities for developing and recovering thin seams and for other seams where partings are too thick for profitable recovery by other mining methods.

In a detailed study of the relative advantages of continuous v. individual splitting, W. D. Meakin, Eastern Gas & Fuel Associates, Pittsburgh, Pa., pointed out that important factors to be considered before making a decision to adopt either method of ventilation include the system of mining in use, thickness of the seam, type of roof support (conventional or bolting), the cost of taking roof or bottom rock, the cost of excessive


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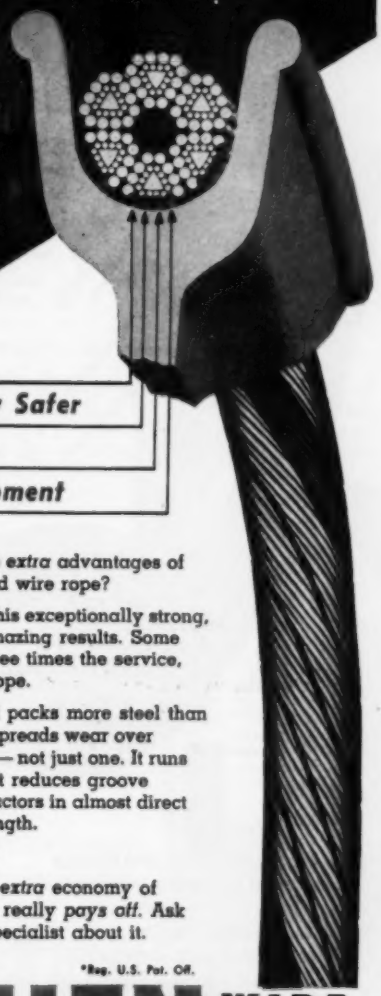

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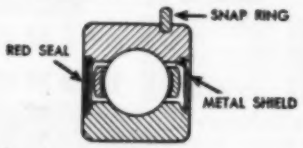


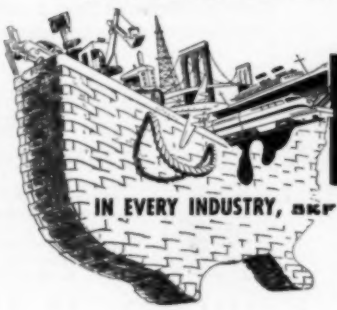

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overcasting and the volumes of air that will be required. For example, while continuous splitting requires a minimum of overcasting, this method may not be applicable in gassy mines where large volumes of air are required to dilute the methane issuing from the coal because, in this instance, main entry velocities would be excessive.

## COAL PREPARATION

Subjects and speakers at the Tuesday morning coal-preparation session were: "Froth Flotation of Anthracite Fines," by H. R. Hagen, mechanical engineer, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.; "Comparative Effectiveness of Coal Cleaning Equipment," by Orville R. Lyons, preparation engineer, Republic Steel Corp., Cleveland, Ohio, and "Theory and Operating Characteristics of the Peterson Top-Feed Reservoir Filter," by R. Piros, research engineer, International Minerals & Chemical Corp., Lakeland, Fla. J. M. Vonfeld, Pittsburgh Coal Co., Pittsburgh, Pa., and D. A. Dahlstrom, Northwestern University, Evanston, Ill., were co-chairmen.

In describing the design and operation of P&R's new Locust Summit flotation plant, which is the culmination of company research that started in 1934, Mr. Hagen pointed out that the entire output of the plant to date has entered new markets, notably, for steam-generating purposes for a power and light company. Using Lasseter cells, the new plant, which went into service May 1, 1950, has produced about 250,000 tons of marketable fine coal in the minus 10-mesh plus 200-mesh size range. Maintenance costs have been low, no lost-time accidents have occurred and a uniform product has been made from feed that may consist of raw-coal fractions from as many as 17 veins. The design of the plant and the skill of the operating personnel share credit for this performance, Mr. Hagen declared.

Basing his direct comparison of several commercial coal-cleaning units on the quantity of misplaced material in the products of these units and upon the difficulty of the cleaning job, Mr. Lyons presented logarithmic effectiveness curves plotted from data obtained in 105 tests of units in service. Mr. Lyons concluded that:

1. The total misplaced material in washed coal and refuse products, as determined at the gravity of separation and expressed as a percent of the feed, is directly proportional to the percentage of plus-or-minus 0.1 near-gravity material in the feed.

2. To determine the effectiveness of a washing unit, it is necessary to have complete float-sink data for the composite washed coal but it is not necessary to conduct exhaustive float-sink tests on the products of the washing unit. A single gravity is all that need be used if it is approximately the gravity of separation.

3. The quantity of misplaced material may be distributed in varying proportions in the products but the total misplaced material remains essentially the same. Therefore, it is possible to regulate the washing equipment to permit less mis-


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Durable PLASTEX PIPE assures long trouble-free service life in all types of mine piping applications. It is guaranteed against rust, rot and electrolytic corrosion and the smooth internal surface remains permanently free of scale or other sedimentary deposits. This means greater flow and the elimination of costly maintenance for pipe cleaning and replacement.

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## COAL MEN ON THE JOB

ATLAS COAL CO., CAPITO, BELL COUNTY, KY.: C. S. Williams (seated, left), chief electrician, and J. P. Upchurch, superintendent; C. E. Raney (standing, left), office manager, and Cecil Dreen, outside foreman.

KENTUCKY RIDGE COAL CO., FIELD, KY.: Maynard Cox (left), electric repairman; W. F. Martin, chief electrician; E. E. Hensley, superintendent; Sam Dodd, general mine foreman; and Vernon Howard, haulage boss.

placed material in the washed coal, and, relatively speaking, it is possible to obtain either a high-ash or low-ash coal while separating at essentially the same gravity.

Successful application of the top-feed-reservoir Peterson vacuum filter to mechanically dewater 14 x 150-mesh coal has been achieved by the Truax-Traer Coal Co., Ceredo, W. Va., Mr. Piros said. Surface moisture averages about 15.6% in handling up to 100 tph in two 6 x 10-ft units with negligible maintenance and smooth operation in spite of surges in solids in the feed.

Lead-off speaker at the Tuesday after-


Here's a steady supply of Oxygen and Acetylene

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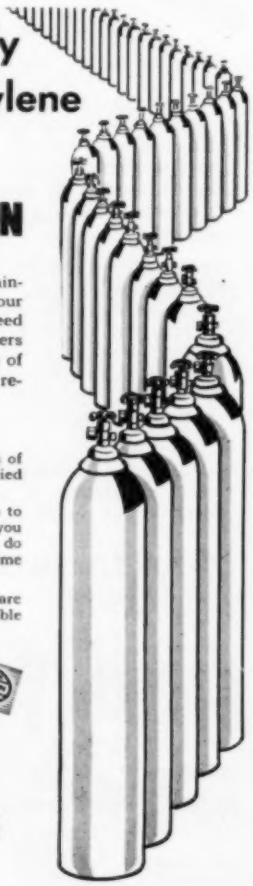

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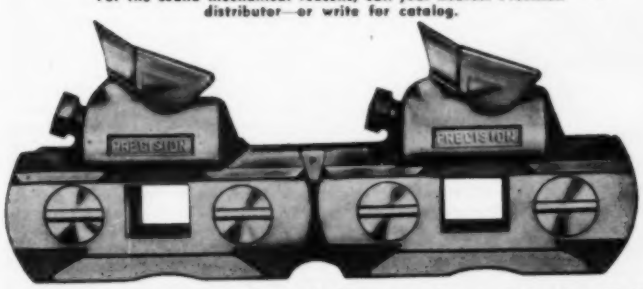

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*Accurate and Portable* — This scale can be transported from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Once located, it can be readied for use in minutes.

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4. No time lost during change-over. Conversions take less than 30 days.
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noon session, which continued the coal-preparation theme, was Nelson L. Davis, president, Nelson L. Davis Co., Chicago, Ill., speaking on the design of vessels for dense-media separation. Other speakers and their subjects were: Mr. Vonfeld, on the application of coarse-coal magnetite separators in an existing circuit; Adam Wesner, Battelle Memorial Institute, Columbus, Ohio, on the preparation of low-ash coal in a continuous heavy-liquid bath; and J. J. Bean, American Cyanamid Co., Stamford, Conn., on factors to be considered in the design and selection of medium-recovery circuits. Co-chairmen were W. T. Turrall, superintendent of preparation, Lehigh Navigation Coal Co., Lansford, Pa., and George Creelman, research co-ordinator, M. A. Hanna Co., Cleveland, Ohio.

Illustrating his explanation of the fundamental principles of heavy-media separation with slides showing up-to-date units, Mr. Davis pointed out that research and field testing have resulted in simplified dense-media circuits for producing better coal from variable feed while reducing the need for close supervision and a high degree of operating skill. In addition, new circuits require fewer units for recovery of the medium, reduce the make-up medium required and materially reduce the residual process water requiring clarification before it can be re-used.

From 1945 to 1951, there has been an increase of 46.3% in the clean coal produced per man hour, Mr. Vonfeld said, in describing operations of two Link-Belt drum-type separators in the cleaning plant at Renton No. 3 mine, Pittsburgh Coal Co., Renton, Pa. One of the units cleaning 3 x ⅜-in coal at 1.52 sp gr produces an 8.9%-ash product at a Fraser-Yancey efficiency of 95.8%. The other unit, cleaning 6 x 3 at 1.52 produces 6.1%-ash coal at a Fraser-Yancey efficiency of 99.9%. Power consumed by the separators for pumping, screening, conveying, driving and medium recovery is approximately 275 kw, and cost per ton of clean coal is 14.88¢, including labor, maintenance, supplies and power.

Any dense-medium process is only as good as its medium-recovery system, Mr. Bean declared in listing the functions of a recovery system as (1) recovering medium, (2) removing extraneous water and fine solids from the feed to the recovery system, and (3) providing controls to govern the separating gravity. Principal methods for recovering medium are settling and decantation, flotation, and magnetic cleaning. Practice in the United States is confined almost entirely to settling and decantation for reclaiming sand in the Chance process and magnetic methods for magnetite units.

A process for the successful continuous production of coal of such purity that it could be used in place of petroleum coke for making electrodes was the subject of Mr. Wesner's presentation. Batch float-sink tests, run on minus 10-mesh plus 35-mesh coal from the Eagle seam, showed that if the separation was made at a gravity of 1.27 the float product would meet the required specifications of less than 1% ash and less

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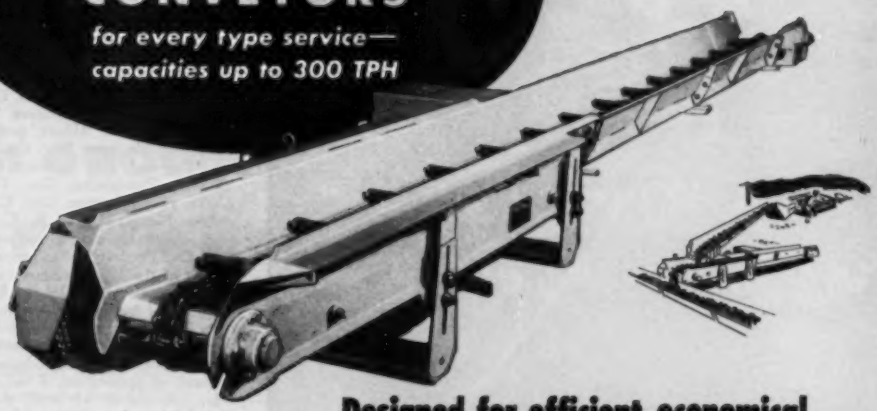
*for every type service—*
*capacities up to 300 TPH*



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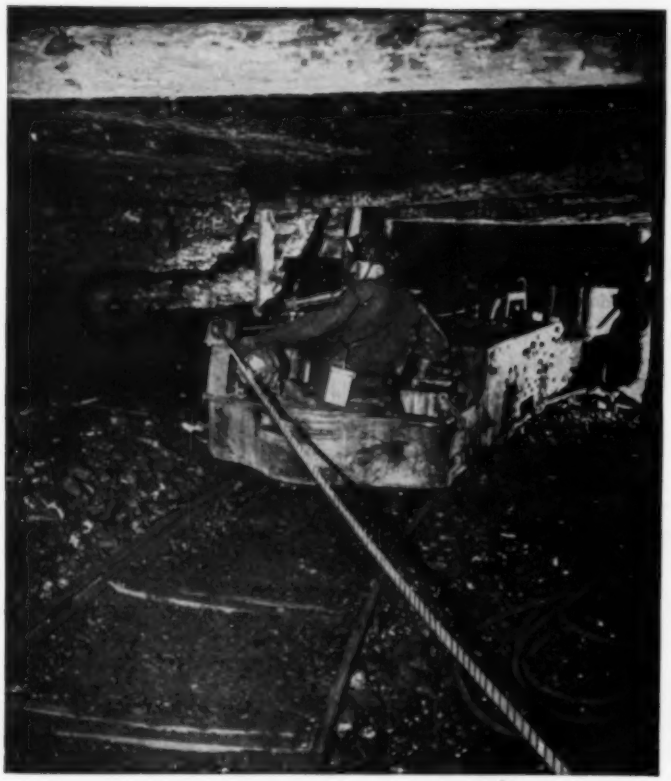

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than 0.4% combined iron and silicon. In the continuous process, which was based upon the results of the float-sink tests, the coal was cleaned in a specially-designed vessel containing a calcium-chloride solution and a wetting agent, Mr. Wesner explained. The resulting product assayed 0.92% ash, 0.087% iron and 0.152% silicon, thus satisfying specifications. Recovery was 84% of the theoretical recovery indicated by the batch tests, Mr. Wesner reported.

## HANDLING FROZEN COAL

The handling of frozen coal, from mine to customer, was the subject of a panel discussion Wednesday morning. Panel members were: W. E. Dickinson, Calcium Chloride Association, Washington, D. C.; T. S. Abbott, project engineer, Allis-Chalmers Mfg. Co., Milwaukee, Wis.; and R. D. Curfman, Cleveland Electric Illuminating Co., Cleveland, Ohio. E. D. Benton, Ohio Coal Association, Cleveland, and R. E. Zimmerman, chief preparation engineer, U. S. Steel Co., Pittsburgh, Pa., presided.

One of the big advantages of freeze-proofing coal with calcium chloride at the point of loading is the reduced labor costs for unloading that coal in the yards of retail dealers, Mr. Dickinson said, in pointing out some of the advantages and methods of application of calcium chloride. A survey of retail yards near Philadelphia showed that labor charges of $1.00 per ton for unloading untreated coal far surpassed the average unloading-labor charge of 20¢ per ton when calcium chloride was applied by the shipper. The compound may be applied in flake form when the coal carries excess surface moisture, or in a water solution where drainage from the loaded cars is not evident.

For best car-shaker performance, total moisture should be limited to a maximum of about 6% and ¼ x 0 fines should make up less than 15% of the coal in the car, Mr. Abbott declared in listing the inherent advantages of car shakers as (1) increased safety for the unloading crew, (2) low initial cost and (3) lower unloading-labor costs. At well-designed unloading stations, up to 10 cars per hour can be handled by a single car shaker, Mr. Abbott said.

Presenting the customer's viewpoint, Mr. Curfman stated that the main requisites of a large unloading station which must handle frozen coal are maximum safety for the employees, an unloading rate that will insure a steady flow of fuel to the plant bunkers, and reasonable cost. Based on an average unloading duty of 170 cars per day, Mr. Curfman reported a cost of 9.75¢ per ton for all coal requiring thawing in 1951. Half this cost was charged to overtime labor which is the best point of attack for reducing handling charges.

In describing the use of high-pressure oil torches for speedy thawing, Mr. Curfman warned that flames should be kept away from car stencils and brake assemblies because of the damage charges that might possibly be levied. Brake cylinders contain leather gaskets that will be destroyed by excess heat, Mr. Curfman ex-

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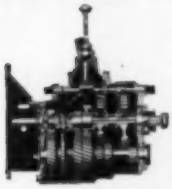

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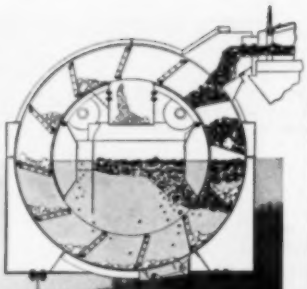

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plained. In some instances, selective buying of low-moisture coals that can be handled by car shakers will help.

The following men read papers at the Thursday afternoon session on preparation and utilization: D. A. Dahlstrom, Northwestern University; E. O. Monge E., Pennsylvania State College, whose paper was prepared jointly with Shiou-Chuan Sun, of the same institution; and C. E. Lesher, consulting engineer.

Hydraulic water cyclones are practicable for cleaning fine coal and a desliming coefficient of 0.2 or less now is possible, said Mr. Dahlstrom. In addition to eliminating over 90% of unwanted slimes from the underflow, the cyclones require less water than classifiers and tolerate a higher slime content in feed slurries. Hydraulic water additions do the required desliming job in a single piece of equipment without any sacrifice in slurry rate. Operation is simple and requires little if any attention. High efficiency in removal of unwanted slimes is desirable because: (1) modern markets require high purity in fine solids; (2) because of water shortages, restrictions on waste-water disposal and high clay percentages in run-of-mine solids, the slime contest of circulating water must be held at a high level; and (3) a heavy solid concentration in the feed slurry must be handled in some plants.

Preparation characteristics of an anthracite from La Limena mine, Peru, were described by Mr. Monge E. The coal has a specific gravity of about 2.0, a high percentage of finely divided impurities, a low grindability and a high proportion of silt product in run-of-mine product. The raw coal runs about 30% ash, 5% volatile matter and has a high percentage of fixed carbon. Conclusions following extensive studies are: (1) plus 3¼-in lumps can be handpicked to obtain a clean product of about 20% ash; (2) plus 3/16-in sizes are extremely hard to clean by gravity methods; (3) a moderate yield of clean product can be concentrated from the 3/16-in x 35-mesh run-of-mine by tabling, jigging or hydraulic classification; and (4) minus 35-mesh coal can be cleaned easily by flotation or agglomeration.

Low-temperature carbonization in its early stages was directed largely at the production of chemicals from fine coals, said Mr. Lesher, who traced the history of low-temperature treatment of coal and described the Disco process in some detail. Recounting his personal experiences, his trial-and-error methods, his failures and his successes, Mr. Lesher declared that he always was interested in making a solid fuel from coking-coal fines and, secondarily, capturing whatever chemical by-products might evolve. With this end in view, he ultimately came up with a modification of the Wisner process that satisfactorily solved the problem of the stickiness of coking-coal fines in retorts.

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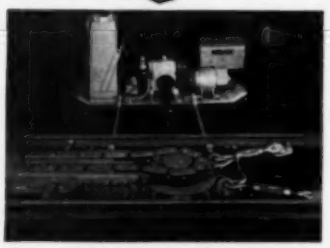

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covered new and improved techniques of gasification, plant design, direct hydrogenation, chemicals output, underground gasification and gas economics.

The following men read papers at the Wednesday morning session: A. C. Fieldner and L. C. Skinner, USBM; E. E. Donath, Koppers Co., Inc.; J. W. R. Rayner, Imperial Chemical Industries, Ltd.; Wilhelm Flesch, Badische Anilin & Soda-Fabrik; and L. J. Jolley, A. Poll and J. E. Stantan, Fuel Research Station, London.

Papers at the afternoon session Wednesday were by: Du Bois Eastman, The Texas Co.; J. P. McGee, L. D. Schmidt, J. A. Danko and C. D. Pears, USBM, whose joint paper was read by Dr. Schmidt; H. W. Nelson and H. H. Kouns, of Battelle Memorial Institute, together with B. O. Buckland, General Electric Co., who presented their joint paper; M. H. Fies, Alabama Power Co.; and L. L. Newman, USBM.

At the Thursday morning meeting papers were presented by: C. R. Breck, Southern Natural Gas Co.; A. R. Powell, The Koppers Co., Inc.; J. E. Tobey, Appalachian Coals, Inc.; R. C. Johnson, Anthracite Institute; and W. C. Schroeder, USBM.

The following men served as chairmen of the sessions on gasification and liquefaction: Wednesday morning—J. D. Dougherty, USBM, and F. M. Stephens, Jr., Battelle Memorial Institute; Wednesday afternoon—J. F. Barkley, USBM, and T. C. Cheasley, Sinclair Coal Co.; Thursday morning, L. D. Schmidt, USBM, and C. C. Wright, Pennsylvania State College.

Opening the symposium, Dr. Fieldner reviewed gasification methods now in the pilot-plant stage and outlined the problems ahead.

Although refractory erosion is a serious problem, a pilot-plant downflow pressure gasifier at the USBM station at Morgantown, W. Va., makes a synthesis gas directly from coal, Dr. Schmidt reported. Results at 100 psig show that it is possible to gasify 120 lb of coal per hour per cubic foot of gasifier volume with over 90% gasification of the carbon and a $CO_2$ content of less than 10%. Coal feed is 90% minus 200-mesh. Primary purpose of the tests at Morgantown is to produce a synthetic gas for pipelines, a gas for synthetic liquid fuels, or hydrogen for use in a coal-hydrogenation plant or for ammonia.

Pilot-plant runs indicate economy and feasibility for a new-type gasifier using either coke or non-coking coal as a fuel in a fluidized process, Mr. Rayner said. In the newest design, capital costs have been cut by designing a single vessel for carbonization and steaming. Mean time of residence of a coal particle in the steam chamber is 2 to 3 min at temperatures of 930 to 950 C. Dust losses are low but some troubles have developed with sintering of particles at high temperatures.

Describing the Winkler gasification process and its modifications, Dr. Flesch outlined the search for a universal process that will gasify all types of fuel—coal, oil and oil residues. The Winkler process, he said, is extremely flexible and nearly

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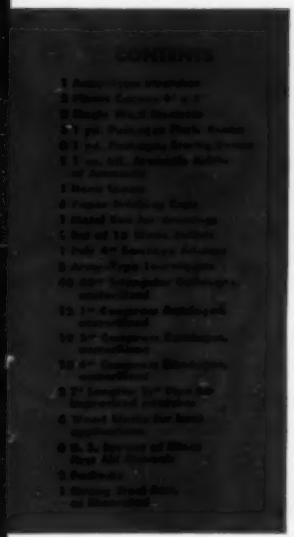

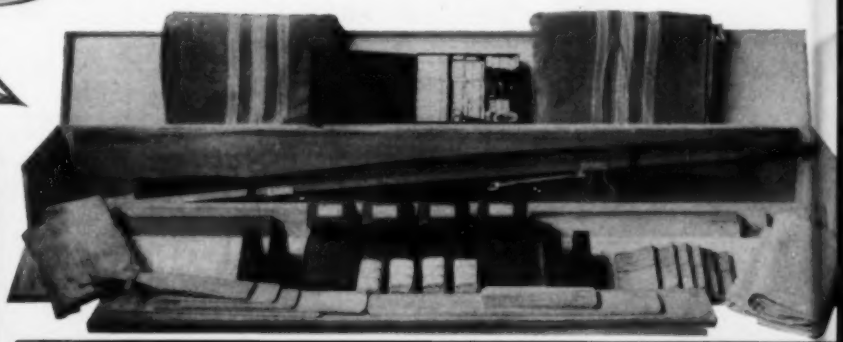

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universal. It is continuous and uses only a single vessel. Basically, the method gasifies finely divided particles in a whirling bed.

Finely divided non-caking and weakly caking bituminous coals have been gasified with steam at 800 to 900 C in fluidized beds, according to Messrs. Jolley, Poll and Stantan. Their paper was presented by E. T. Wilkins, of the British Mission. The heat of reaction is provided by conduction through a metal wall surrounding the gasification chamber. Gasification rates are comparable with those of conventional water-gas generators, with a temperature difference of about 100 C between combustion and gasification zones. Rates of gasification are up to 15 lb of fixed carbon per square foot per hour at 850 to 900 C in the experimental unit. The big problem is the carry-over of fine dust, totaling as much as 40% of the fuel fed. Commercialization of the conduction method must await the availability of suitable construction materials and the development of suitable heating elements.

Various pressure-gasification tests by The Texas Co. were described by Mr. Eastman. These tests look toward reducing the size of the plant and the cost of operation. Losses from an experimental fluidized-bed operation led to tests involving suspension of coal particles in superheated steam and use of cyclones to remove solids from the exhaust. Recovery of solids totaled about 99%. One type of operation was at temperatures below the ash-fusion point. Another was a slagging operation with temperatures well above the ash-fusion point. The Texas Co. has found that the generator itself can be built of solid refractory walls or of refractory-coated tubes to make a water wall. Results have run as high as 100% carbon conversion and about 90% usable gas. At temperatures from 2,100 to 2,400 deg, ovygen consumption runs about 350 to 400 cu ft per 1,000 cu ft of gas produced and there appears to be a good chance of reducing oxygen consumption. The product gas contains hydrogen and $CO_2$ in a 1:1 ratio.

Using 5 to 9 atmospheres of pressure for gasification experiments, General Electric Co. has produced a gas that may prove satisfactory for turbine fuel, Mr. Buckland reported. Heat loss and solid-matter carryover are held to a minimum, he said. The type of producer developed could meet changing load demands quickly, and quantity of solid-matter carryover could be controlled by changing the air rate, the steam-air ratio or the temperature of the made gas. Satisfactory tests have been made on two Pittsburgh-seam coals and one Illinois coal containing from 32 to 37% volatile matter and with ash-fusion points ranging from 1,920 to 2,400 deg.

Summarizing the trends in gas manufacture and marketing, Mr. Newman listed the following:

1. The movement away from water-gas to oil-gas plants.


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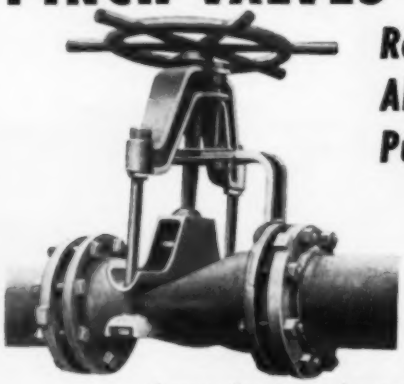

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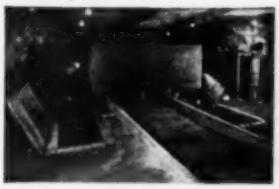

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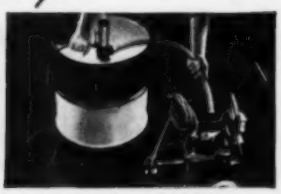

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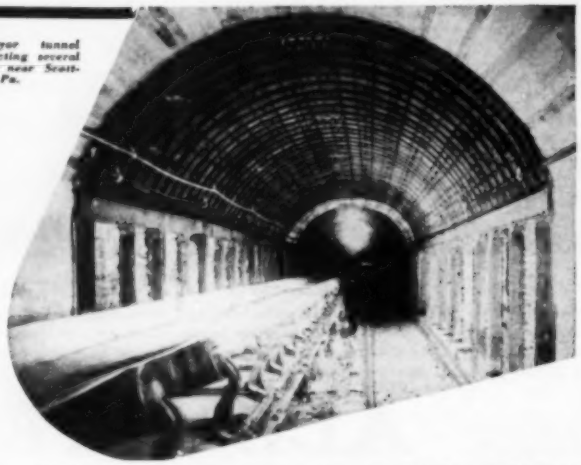

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2. The growth of natural gas and the decline of producer gas to standby status.
3. The increasing load on natural gas for manufacture of ammonia.
4. The growing inability of natural-gas pipelines to meet demand.
5. The failure of natural-gas exploration to discover new reserves equal to withdrawals, with the prospect that the tide will turn in favor of producer gas in the future.
6. The increasing use of oxygen in gas manufacture.
7. The displacement of coke in gas manufacture by coal, chars and lignite.
8. Wider studies looking toward the use of low-reactive coals, possibly by entrainment, in gas manufacture.
9. Wider use of high-pressure gas generators.
10. The search for a high-Btu pipeline gas made from solid fuel.
11. Further experimentation with gasification of coal in place, looking especially to prevention of leakage.

World-wide efforts to gasify coal underground were reviewed by Mr. Fies, who summarized tests in the United States at Gorgas, Ala., and Hume, Mo., and in Italy, Belgium, French Morocco and Great Britain. Dr. Fies' paper was read by Dr. Wilkins. Underground gasification, he concluded, "is no longer a scientific curiosity. I am convinced that this process is well on the road to practical exploitation." Experiments have been carried out on coals of widely varying characteristics, in horizontal and pitching seams, and under various kinds and depths of cover, he reported. The result is a fast-growing body of information that soon may put underground gasification on a commercial basis, though there still are many problems to be solved.

**For a fast-moving report on the recent international conference on underground gasification held at Birmingham and Gorgas, Ala., Feb. 12-14, see p 96 of this issue.**

## ECONOMICS OF GASIFICATION

Synthetic pipeline gas eventually will have to supplement natural gas but this development may be further in the future than expected, Mr. Breck said. Cost will be the big obstacle. On the basis of experiments, Southern Natural Gas Co. estimates the cost of synthetic pipeline gas, made by a modified Lurgi process and containing 925 Btu per 1,000 cu ft, at 54.77¢ with coal at the plant at $3.75 per ton. A plant of commercial size would entail an investment of $259,000,000. Even so, it may be economically possible to supplement natural gas with synthetic gas during peak winter loads along the Monongahela River. The question is "When?" rather than "How?" he said. The FPC now uses a multiplier of 20 to determine the quantity of reserves needed to support annual demand. On the present basis of 7,000,000,000,000 cu ft of annual use and with reserves of 190,000,000,000,000 cu ft, natural gas now has a reserve of some

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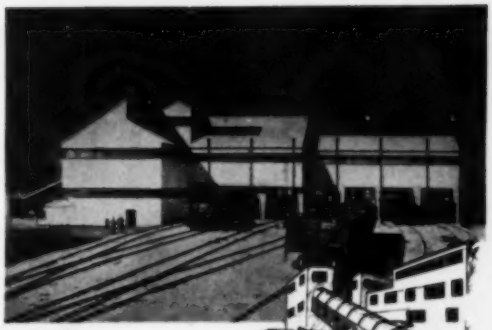

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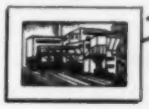

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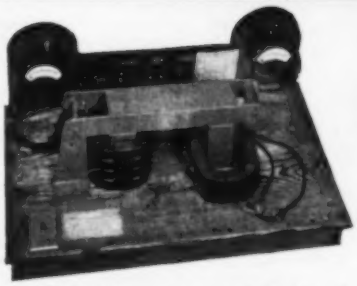

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50,000,000,000,000 cu ft over FPC requirements. But demand is growing so fast that 20 soon may be an unrealistic multiplier, he said.

Arguing that natural gas will become less available and more costly in the future, Mr. Powell predicted that soon direct gasification of coal will replace conventional methods involving the use of coke. A Fischer-Tropsch industry producing 700,000 bbl per day of products would produce chemicals in volume 2 to 15 times as great as the present market for chemicals, but the chemical industry is growing so fast that such output would not glut the market.

Manufactured gas will stage a comeback far greater than its past experience, Mr. Tobey predicted. The rate of growth will depend upon the exhaustion of natural gas and the development of new processes for making gas from coal. The first plants probably will provide gas to supplement natural-gas pipeline traffic. If satisfactory low-temperature processes can be developed, local public utilities will absorb all the gas that can be made. In addition, a good many industries will turn to low-Btu gas if it can be made cheaply and in adequate quantities. Wide use of coal for gas-making will level out coal production through the year, balance utilization of various sizes, provide a market for a wide range of coals from anthracite to lignite, and make possible the wider use of continuous mining machines, which produce higher percentages of fines.

On the anthracite side, wider gasification will increase the value of two by-product fuels now held in storage as refuse by the anthracite industry, Dr. Johnson said. These by-product fuels are slate and bone, which now are being stored at the rate of 20,000,000 tons per year. Anthracite, being non-coking and non-caking and having high-fusion ash and little sulphur, lends itself well to gasification and can be used to make a good synthesis gas, as well as hydrogen. Besides slate and bone, which contain some 30% ash and about 40% fixed carbon, about 130,000,000 tons of anthracite silt can be recovered to make fuel or synthesis gas. In addition to this, the anthracite region has ample water supplies for processing coal, plenty of skilled labor, and is close to major industrial markets, Dr. Johnson said.

There are new horizons for coal in electric home heating, chemicals, synthetic gas, nitrogen manufacture and power generation for aluminum reduction, Dr. Schroeder declared. With growing demand for agricultural fertilizer, the Department of Agriculture soon may join the USBM in a joint study of ways and means of making nitrogen from coal. Lignite already is being planned for use to make electric power for a big aluminum plant in Texas. The thinking in aluminum circles followed this line: Escalator clauses in new natural-gas contracts would push fuel costs higher in the years ahead. At that time, the cost of converting from gas to solid fuel would be prohibitive. Therefore, solid fuel now would turn out to be a long-run economy and sales of by-product

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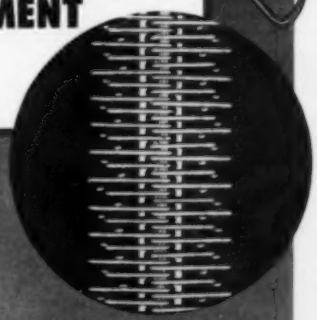
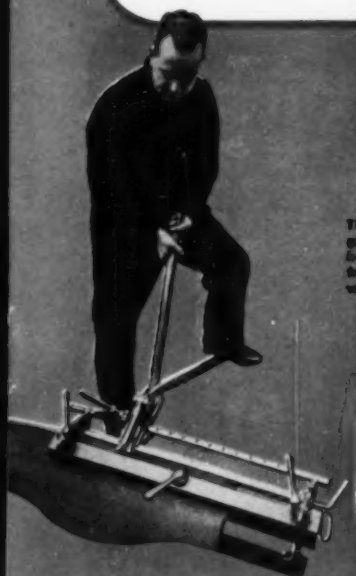


The Hayden Joint Pattern—the ground pointed hooks penetrate the belt at the farthest possible point from the ends and knit into the belt with a curly "bulldog grip."



Simple instruction will immediately enable an inexperienced workman to obtain uniform professional splices with the Hayden splicing machine.

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20 to 30 per cent stronger than any other mechanical splice. Five Hayden hooks to the inch—135 to each end of a 30 inch belt—every hook is automatically and perfectly aligned to take its share of the load and interlace with the corresponding hooks on the other end of the belt or mating insert. Every hook is ground to a fine point to penetrate the belt without cutting, tearing, removing or weakening the belt fibre.

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**Splices Are Fully Interchangeable**

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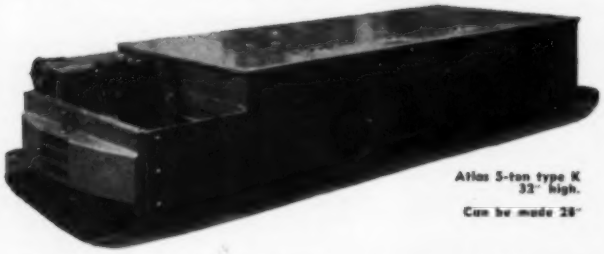

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chemicals meanwhile would offset the higher present cost of solid fuel.

How will coal replace other fuels when they grow scarce? Dr. Schroeder said that domestic users, railroads and marine vessels will not return to solid fuel and that coal therefore must be provided in the form—liquid or gaseous—demanded by customers. The coal industry now is well on the way to processes that will secure coal's place in the fuel and chemical fields. Better gasification methods and the rising cost of natural gas will close the price gap now existing. There still is time, but not much time, for the coal industry to get ready for the future, Dr. Schroeder added.

Throwing new light on natural-gas prices, Mr. Cheasley, speaking from the floor following Dr. Schroeder's paper, reported that the latest natural-gas contracts carry a price of 12¢ per 1,000 cu ft, with an escalator clause adding 1¢ per year. He added that the quality of natural gas also is declining, with a Btu content of about 965 per cubic foot at present against former content of 1,100 Btu.

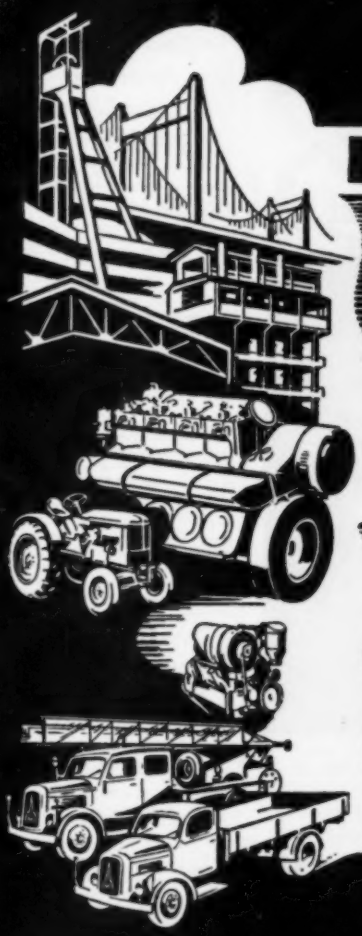
## COAL HYDROGENATION

The economics of coal hydrogenation indicate that the first commercial synthetic liquid fuels plants must be located in low-cost coal areas where natural gas is available, Mr. Skinner said. Highly reactive coals from the West lend themselves best to the process, he pointed out. Speaking of plant construction, he listed the changes in design and operation that will result in lower investment cost for a hydrogenation plant. Total capital requirements for a commercial-size plant would be in the order of $175,000,000, he said.

Commercial production of chemicals from a hydrogenation plant will require equipment over and above that required for production of liquid fuels, Dr. Donath predicted. He pointed out that gasoline made by direct hydrogenation of coal contains a higher percentage of ring compounds, such as benzene, than that made from petroleum. He estimated at $326,000,000 the cost of erecting a 30,000-bbl-per-day plant for chemical production and said that such chemicals would not be in oversupply if such a plant were built.

Commenting on the two papers on hydrogenation, Dr. H. H. Storch, USBM, stressed the need for cheap-mined coal and pointed out that products made from cheap Wyoming coal still would have to be shipped long distances to markets.

Dr. Schroeder, following Dr. Storch, pointed out that all capital cost studies to date on liquid fuels from direct hydrogenation, including the study made by the National Petroleum Council, have been based on the original German design for a Bergius plant. Modifications since made in the basic design will result in considerable cost savings. He explained that the big difference between hydrogenation-plant cost estimates made by the NPC and the USBM lay in methods of computing operating costs, and he argued that eventually synthetic liquid fuels will come to a point of sound economics on a commercial basis.



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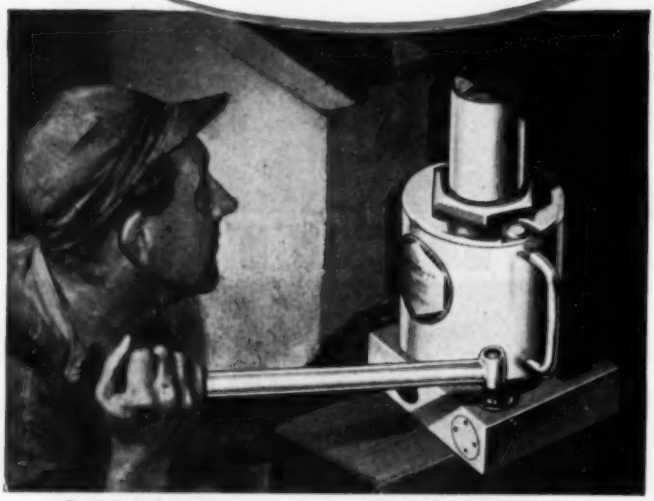

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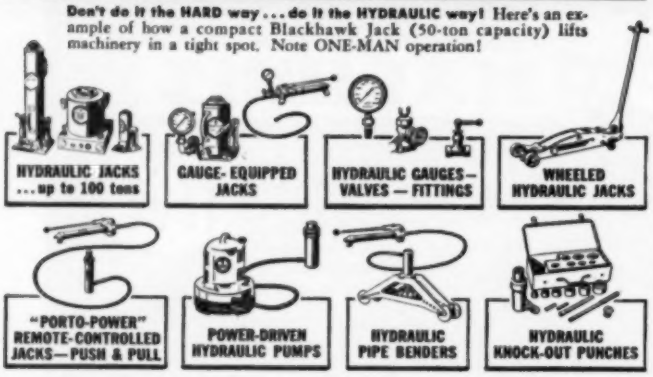


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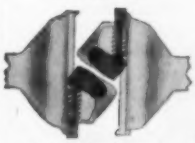

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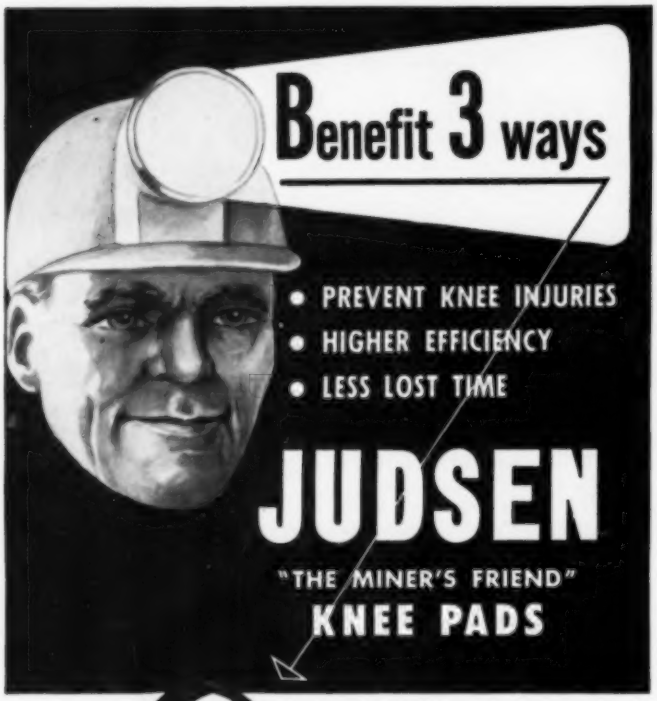

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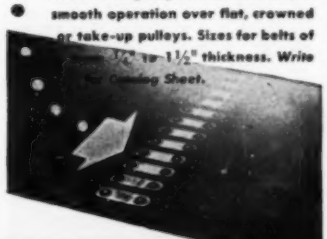

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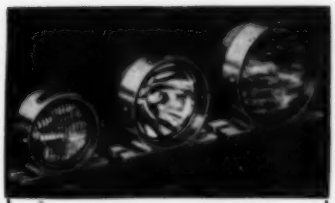
**"design for MODERN mining"....**

will present a complete appraisal of equipment, supplies and methods needed for lower costs, higher quality and greater safety.





**GUYAN *Sealed Beam* HEADLIGHTS for MINE EQUIPMENT**

GUYAN Sealed Beam Headlights are made in three sizes to meet various mining conditions. The voltage rating is 6 volts for all three types. To operate from 250 or 500 volt trolley voltage we can furnish either a resistor or a power unit.

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Type ML for main line locomotives has a narrow, powerful beam (70,000 beam C.P.)

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*Write for Bulletin*

**GUYAN MACHINERY CO.**

LOGAN . . . . West Virginia



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Dependably constant in operating efficiency, Deming Pumps have proved they are "MINE-WORTHY". The Deming Distributor in your area is qualified to give you competent assistance. When your next pumping problem demands expert attention, investigate Deming "MINE-WORTHY" Pumps.

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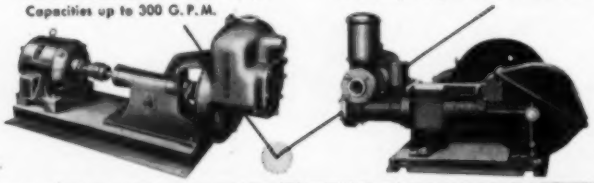
**OIL-RITE** Fig. 1895 Double-Acting Mine Pumps. Capacities up to 100 G.P.M.



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EQUIPMENT
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needed for
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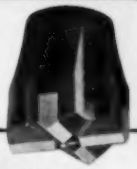

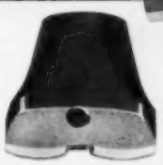

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C. O. C. C. Personalized Service in Workmen's Compensation and Public Liabilities can add efficiency to your mining operation while lowering operational costs. Our established engineering facilities are available to help increase production, lower accident frequencies, save operational time and equipment. In addition, prompt claims handling and effective rehabilitation of injured personnel promote harmony and production efficiency.

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GREENSBURG, PA.

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- Takes 15% grades in transmission direct gear.
- Allows the torque converter to do over 90% of the braking without the use of friction brakes.
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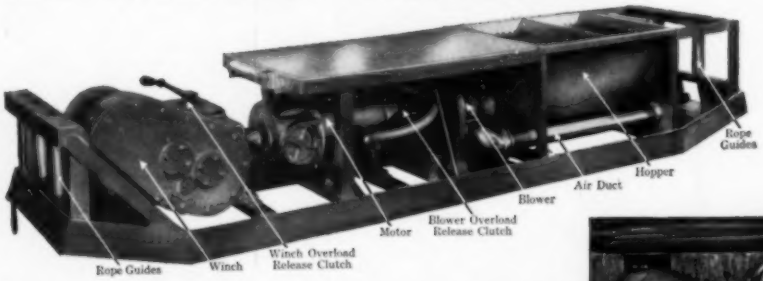
TALK WITH DART ABOUT YOUR TRUCK PROBLEMS
YOU'LL GET SPECIALIZED SERVICE.

**DART TONNAGE ENGINEERED TRUCKS**

DART TRUCK CO. KANSAS CITY 8, MISSOURI

**OVER 40 YEARS EXPERIENCE IN BUILDING SPECIALLY ENGINEERED TRUCKS**

# *"FOR SAFETY'S SAKE" every mine should have*
## THE "LITTLE CHIEF" *DUST*RIBUTOR




***Supplied with or without winch . . . with or without wheels.***

### *Ideal for "low" mines . . . and small mines*

New, mobile and portable. "Heap big power dusting job," through 50 to 250 feet 1¾" hose . . . mounted on carriage, or with winch on skids . . . pulls itself on and off cars and conveyor belts . . . travels on skids 40 feet per minute, can be supplied without winch. May be had dust tight or Bureau of Mines approved, permissible with trolley tap or permissible plug for use of shuttle car.

*Mechanical Track Cleaners—Automatic Doors—Car Transfers—Cable Splicers & Vulcanizers—Safety Signal Systems.*

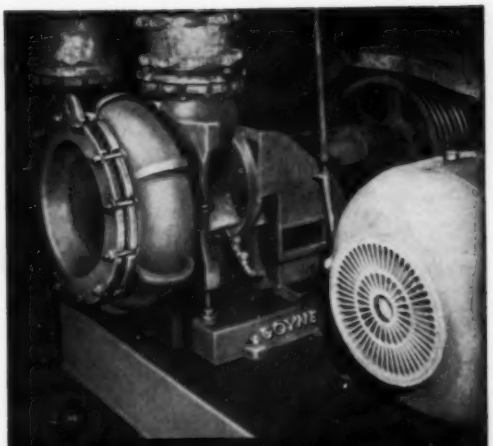
### *Dustscontinuously . . . no "resting"*

Length (with winch) 8'-6"; length (less winch) 7'-0"; height on skids 18"; width 20"; weight (with winch) 825 lbs., weight (less winch) 630 lbs.; hopper—capacity 2½ sacks; motor—5 H.P., 1750 R.P.M. compound wound; voltages available—90, 230, 550 D.C., 220-440 A.C.; dusting capacity—35 to 50 lbs. p.m. dry rockdust; bearings, motor, blower, winch, conveyor—anti-friction. Safety overload releases; quick hose attachment.

**Write for full specifications. Please use street and zone numbers.**

**AMERICAN MINE DOOR CO.**

**2057 DUEBER AVE.** **CANTON 6, OHIO**



# GOYNE
## SOLIDS HANDLING PUMP

**Feature:**
**LOW-COST OPERATION**

**GOYNE SOLIDS HANDLING PUMPS are extremely popular with a very large number of coal companies who find them quite reliable for pumping:**

**Liquids with solids added to increase specific gravities for coal and refuse separation in coal preparation plants.**

**Disposing of refuse and silt by pumping to waste material banks or for back filling into mined out areas.**

**Pumping prepared coal to temporarily desired storage areas.**

**These specially designed Goyne pumps incorporate numerous features to reduce upkeep and labor maintenance costs to a minimum:**

**1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing *only the rear head of the pump.* No suction or discharge piping or any other major part of the pump is disturbed.**

**2. The only packing box of the pump is subjected to the low suction pressure rather than to the discharge pressure developed by the pump. This feature assures long packing and shaft sleeve life.**

**3. Impeller clearance is adjusted while the pump is running, insuring constant pump capacity so essential for uniform washing.**

**4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.**

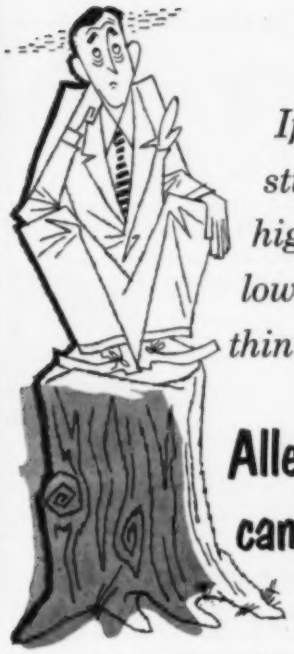
**5. Spare parts are carried in stock at our plant for prompt shipment. Reduce your inventory by using Goyne Process Pumps.**

***All inquiries are given a thorough engineering analysis and our prompt attention.***

GOYNE MINE PUMPS 1881

**The GOYNE STEAM PUMP CO.**
ASHLAND, PA.





*If you're stumped by high costs... low tonnage... thin profits...*

# Allen & Garcia can help you!

Any one of those problems unsolved in your business can put you OUT OF BUSINESS! But if *you* can't find a solution, then what? *Then it's time to turn your problem over to Allen & Garcia engineers.*

Professional mine engineering—from top to bottom, inside and out—is our exclusive business. A & G engineers are specially trained to locate trouble quickly and find ways to cut costs, raise tonnage and increase profits for small mines as well as the largest. Unencumbered by affiliation with *any* manufactured products, our recommendations are completely unbiased.

So if you find yourself stumped, call in Allen & Garcia without delay. Preliminary consultation is yours entirely without obligation.

**SCOPE OF SERVICES**

- Design and construction of new plants and their various units.
- Organization, operation and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and various mining problems.
- Valuations for financing, fire loss, taxation purpose—reports and appraisals.

We work with undivided responsibility to you on a cost and fixed fee basis. We are not hampered by any connections which might prejudice the true professional engineering approach to your problem.

A & G

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*Consulting and Constructing Engineers*

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*To guide you in*

## control of air pollution

seven panels of experts offer

well-checked facts and methods

Here is a systematic presentation of some of the most useful information that has been amassed about the pollution of air: its effects on human, plant, and animal health; the measures that are being taken to control it successfully; the legal and administrative problems that are being overcome in connection with pollution prevention and control.

These are the specific, authoritative facts presented at a top-level government conference on pollution—a conference that brought together experts in every phase of the problem. Here is the picture of how contamination of the air affects humans, livestock, and crops, and of which chemicals are really dangerous and which are not. Here are detailed analyses of different contaminants, with methods for finding the nature and degree of pollution. Included is a discussion of the very latest equipment for pollution control, with an explanation of how each kind works and what its limitations are. The section on instruments describes and explains best practices of measuring the kind and degree of pollution. One section covers the legal problems involved in drawing up and enforcing pollution control statutes. The interrelation of weather and climate and pollution problems is fully treated.

***Just Published!***

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**Proceedings of the United States Technical Conference on Air Pollution**

Sponsored by the Interdepartmental Committee on Air Pollution

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**847 pages, 7½ x 10; 285 illus.; 85 tables; $12.50**

**A few of the 97 topics covered:**

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Physical properties of aerosols
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Use of the midget impinger
Chemical analysis of pollutants
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Odor control practices
Catalytic combustion of hydrocarbon vapors
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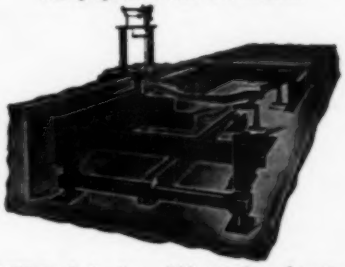
**TRUCK and TRACTOR TRAILER SCALES**

**TYPE "C. S." *Portable Scale*—easily and quickly set up—with preparation held to minimum.**



**TYPE "S" *Pit Scale*—for weighing trucks and tractor trailers—Platform lengths 18 ft. to 60 ft. inclusive.**

## WINSLOW SCALE COMPANY

***TERRE HAUTE 1, INDIANA***

**Scale Manufacturers since 1896**

# "*Sutton*" SAND DRYING STOVES

The Standard for Over Forty Years

**Burns Any Type of Fuel**

The "Sutton" Sand Dryer may be fired with any type of fuel. While most "Sutton" Sand Dryers are equipped to burn coal, they can be furnished with burners for natural gas or fuel oil.

**"SUTTON" FEATURES**

- **Simple in operation**
- **No skilled labor necessary**
- **Made in four sizes**
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- **Economical upkeep**
- **Topmost efficiency**

***SATISFACTION GUARANTEED***

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After clearing 500 acres of salt marsh for the Leslie Salt Company, J. O. Archibald, contractor of Redwood City, California said, "*LUBRIPLATE kept equipment rolling in mud, muck and water.*" You may never have an earth-moving job like this to do, but if you turn a wheel in any industry, you can profit by Mr. Archibald's experience.

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**FOR BETTER DUST CONTROL**

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**VIKING MACHINERY SALES CORP.**
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"We look into the Earth"

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- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates smoothly through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.
- For conveyor belts 3/16" to 1/2" thick.

***Order From Your Supply House. Ask for Bulletin HF 500.***

**FLEXIBLE STEEL LACING CO**
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# SAVINGS FLOW FROM SPEED-LAY PIPE SYSTEM

***EVERYTHING for a COMPLETE PORTABLE PIPE SYSTEM***

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FACTORY PACKAGED
PIPE—COUPLINGS
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LIGHTWEIGHT, SAVES LABOR
FAST, SIMPLE

DELIVERED
READY FOR INSTALLATION

*Immediate Installation* by one unskilled man. 2½ to 12½ o. d. black or galvanized. Larger sizes can be furnished. Ready to lay—without delay.

***SEND COUPON NOW!***
**ALBERT PIPE SUPPLY CO., INC.**
Berry & N. 13th St. Brooklyn 11, N. Y.
Please send free booklet describing your Speed-Lay Pipe System and services:
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ADDRESS.....
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**. . . YET SCRAP INVENTORIES ARE ALARMINGLY LOW. YOU ARE BEING COUNTED ON TO HELP KEEP THE FURNACES WORKING . . . TO AID DEFENSE**

With our increased steel production, the furnaces are gobbling up an enormous amount of iron and steel scrap.

More—far more—scrap than is at present going into their scrap stockpiles.

Many mills are operating on a hand-to-mouth basis. Some are already threatened with shutdown—for lack of scrap.

**The Danger Is Increasing**

Will efforts to fill the tremendous demands for steel fail because of lack of scrap?

Steel is made from 50% scrap. We could be severely handicapped—in our aim to keep abreast of both military and civilian requirements—if scrap suppliers can't keep pace with productive capacity.

But they *can* keep pace . . . with *your* help!

**Enough Scrap IS Available!**

Yes—the only problem is to get the available extra scrap from where it is—to where it's needed.

Where is it?

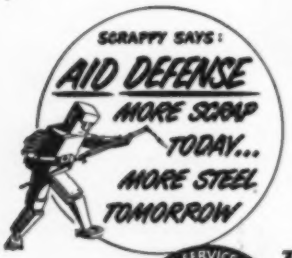
In *your* business . . . in the form of old machines and equipment, tools, implements, dies, jigs, fixtures, outmoded structures, chains, valves, wheels, pulleys—any old iron and steel that's rusting away.

**Six Million EXTRA Tons Needed!**

By the end of 1952, we'll be producing steel at an annual rate of 20 million tons more than in 1950. That means we will need at least 6 million more tons of scrap than we've ever needed before.

It's up to you. Write at once to Advertising Council, 25 W 45 St., New York 19, N. Y., for a free copy of "Top Management: Your Program For Emergency Scrap Recovery".

Please write today—there's not a day to lose.




NON-FERROUS SCRAP IS NEEDED, TOO!

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### PLANT DESIGN ENGINEER

Permanent Salaried position with long established engineering contracting firm specializing in design and construction of ore beneficiation and coal washing plants. Broad experience in material handling systems essential. Kindly submit details of experience, age, salary required, and starting date. All replies strictly confidential.

**P 3592 Coal Age**
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## WANTED — ENGINEER

**ENERGETIC, IMAGINATIVE, SUPERVISORY EXPERIENCE,**

To lead section on development of coal preparation and washery water clarification apparatus. Position permanent for the right man. Box P 3704 Coal Age, 330 W. 42nd St., New York 36, N. Y.

*REPLIES (Box No.):*
*Address to office nearest you*
*NEW YORK: 330 W. 42 St. (36)*
*CHICAGO: 520 N. Michigan Ave. (11)*
*SAN FRANCISCO: 68 Post St. (4)*

***Position Vacant***

ASSISTANT TO Chief Electrical and Maintenance Engineer at group of mechanized mines in Central Pennsylvania. P-3620

***Selling Opportunity Offered***

SALESMAN—NATIONALLY known manufacturer seeking experienced salesmen for its mining department. Must have knowledge of coal mining methods and equipment. West Virginia, Pennsylvania, Ohio, and Eastern Kentucky. Mining acquaintance desirable. Applicants must give age, education, experience and salary required. SW-3537, Coal Age.

***Positions Wanted***

CANADIAN MINING Engineer, 25, 4 years in coal industry. Layout, design, stripping, surveying, exploration. Go anywhere. PW-3753, Coal Age.

MINE EXECUTIVE, 42, married, employed, college-trained. Widely experienced in all phases mining. Thick and thin seams. Excellent mechanical mining man, also stripping experience, cost conscious and producer, capable handling construction and labor. Excellent references. Location no objection. PW-3764, Coal Age.

***Business Opportunities***

**Coal Mining Operation For Lease**

Usual necessary facilities in place, equipment, mining town, two seams developed substantial reserves location Eastern Tennessee. Also large areas undeveloped coal for lease. BO-3245, Coal Age.

1000 Acres Strip Coal.

Western Pa. 5' coal—55' cover. BO-3664, Coal Age.

## WANTED

### ONE MINE CAR ROTARY DUMP

**THE HATFIELD-CAMPBELL CREEK COAL CO.**
**Reed, West Virginia**

## WANTED

**1 Steel Truck Coal Tipple**
**120 feet Steel Flight Conveyor or Belt**

### FOR SALE

**2 35 B Jeffrey Machines**
**MERRICK COAL CO.**
**WAYNESBURG, OHIO** **Phone 2151**

## WANTED

### SCRAP CONVEYOR BELTING

We will buy any quantity of redundant heavy canvas/rubber belting from your conveyors at top price. It must be 5 inches wide or more in 10 foot lengths and up. Write phone wire Homsworth 45 East 49th Street New York 17. Plaza 3-2728.

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*(Classified Advertising)*

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| $1.20 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. |
| **Positions Wanted and Individual Selling Opportunity** undisplayed advertising rate is one-half of above rate, payable in advance. |
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1—400 KW G.E. Syn. 575 V. 720 RPM
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2—300 KW WEST. Syn. 275 V. 1200 RPM
1—300 KW RIDGWAY Syn. 275 V. 1200 RPM
1—200 KW G.E. Syn. 275 V. 1200 RPM
1—200 KW RIDGWAY Syn. 275 V. 900 RPM
1—150 KW WEST. Syn. 275 V. 1200 RPM
1—100 KW RIDGWAY Syn. 275 V. 1200 RPM
2— 50 KW G.E. Ind. 275 V. 1200 RPM

### ROTARY CONVERTERS

1—500 KW WEST. Syn. 275 V. 1200 RPM
1—300 KW WEST. Syn. 275 V. 1200 RPM
2—300 KW AL-CH Syn. 275 V. 1200 RPM
1—150 KW G.E. Syn. 275 V. 1200 RPM

### PORTABLE COMPRESSOR

1—Ingersoll-Rand, Model 25-B, Two Stage Air Cooled, Size 6 x 5 x 5" Stroke 100# Pressure. Driven by 30 HP Westinghouse 230 V. DC Motor with Automatic Starter. Mounted on 36" Gauge Trucks.

### LOCOMOTIVES

2—30 T JEFFREY 250 V. 3-MH-77, 48-36" Ga.
1—25 T G.E. 500/250 V. 3-HM-824-A, 44-36" Ga.
1—20 T JEFFREY 250 V. MH-77, 48-36" Ga.
1—20 T G.E. 250 V. (Tandem) HM-809, 36" Ga.
1—15 T JEFFREY 250 V. MH-110, 48-36" Ga.
1—15 T JEFFREY 500 V. MH-110, 48-36" Ga.
1—10 T JEFFREY 250 V. MH-2110, 48-36" Ga.
2—10 T JEFFREY 250 V. MH-110, 42-36" Ga.
1—10 T WEST. 250 V. ML-907-C 36" Ga.
2—10 T GOODMAN 250 V. 36-B, 36" Ga.
6—8 T JEFFREY 250 V. MH-100, 42-36" Ga.
2—8 T WEST. 250 V. ML-906-C. 44-36" Ga.
4—6 T JEFFREY 250 V. MH-66. 44-36" Ga.
2—4 T GOODMAN 250 V. MS-4-E, 30-24" Ga.

### LOCOMOTIVE MOTORS

2—JEFFREY 250 V. MH-77, Ball Bearing
2—WEST. 250 V. ML-906-C, Ball Bearing
2—WEST. 250 V. ML-906-C, Ball Bearing
2—WEST. 250 V. ML-904-R, Ball Bearing
1—WEST. 250 V. ML-901-C, Ball Bearing
2—G.E. 500/250 V. HM-824-A, Ball Bearing
2—G.E. 85/125 V. HM-826-A, Ball Bearing
4—WEST. 80 V. V-49-X, Ball Bearing
Extra Armatures Available for Above Motors

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*A Quarter of a Century Serving Mining and Industrial Companies*

## FOR SALE OR RENT

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**2 yd. Shovel Attachment with Dipper Stick.**

**2 yd. Owen Clamshell Bucket. Powered by Buda Diesel Engine. Completely Rebuilt from Ground Up by Dempster Brothers, Inc. Can Be Inspected at Knoxville, Tennessee. Ready for Operation.**

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**Three yard Electric walking Drag line**
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Serial No. 4957, mounted on Ansco Shovel Crawlers, operating on 4160 volts with Ward-Leonard control, equipped with 75 ft. boom, 54 ft. dipper handle and 12 cu. yd. bucket. Machine can be seen in operation and is available May 15, 1952. Good condition. Write, wire or phone

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1—36" American Ring Type Coal Crusher
1—50 Ton Truck Scale
3—Caligher Auto. Samplers
10—Tons 65# Rail
1—25 KW, 250 volt Crocker Wheeler DC Generator
1—90 cu.ft. Card Rocker Dump Car, 36" ga.
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1—Bucket Elevator on 8" belt, 20' centers, complete with 3 HP Gear Motor
1—#21½ Vulcan Sgl. Drum Hoist with Power Unit
1—CE-7 Sullivan AC Coal Cutter
1—3200' Aerial Tramway
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1—Box Iron Wks. Single Drum Hoist, direct geared to a 15 HP Slip-ring Motor
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1—Sullivan LW-6 Wagon Drill
2—500 gal. Fuel Oil Tanks
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Revolving Screens
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Motors—¼ HP to 50 HP
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Chain Blocks — 1 to 2 Tons
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1—Vulcan Shaft Hoist, complete with 350 H.P. Motor, control equipment. Complete description furnished on request.
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11—Goodman G15 Shaker Conveyor Drives, with 15 H.P., 250 V. D.C. Motor, starter and jacks included.
3—Goodman E1G16 Duckbill Units, complete.
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550 ft.—Size 1/0, 3 cond., 19 strand 6 x 3/64" Varnished Cambric, 6/64" lead cover—4000 Volt Cable (Anaconda) new and never used (1 full length all on a reel).
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1—Mines Equipment Co. Type 24 Bit Heater with Oil Burner and Blower, complete (new and never used)
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3—150 K.V.A. Transformers, 1 phase, 4000 V. Pri./2300 V. Sec. 60 cyc.
8—U-267-1AE Joy-Kellogg Tire Pump Compressors, 250 V. D.C. Complete.

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10—Joy 6SC Cable Reel Shuttle Cars with adjustable discharge, 34" basic height with 4" removable sideboards, 4 wheel drive, 4 wheel hydraulic steering with hydraulic cable reel. Cars equipped with 450 ft. #4-2 conductor parallel cable with ground wire. Equipment 250 volt D.C. Permissible construction.
5—11 BU Joy-Sullivan Pneumatic Tired, mounted Coal Cutting Machines as follows: Height 31", Width 83", cutter bar length 9 ft. Bar piped for spraying water through bar. Solid bearing cutter head. Kerf thickness 6". Motors 250 volt, D.C. 50 H.P. cutting motor, 26 H.P. hydraulic pump motor controls, permissible type provided on each side of machine. Machine equipped with 350'—3 conductor size 0 rubber clad fire resisting cable, power take-off for coal drill and 3 headlights with 1 extra headlight switch.

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199—1-2-3 drop-bottom mine cars, 6-ton capacity, 42" gauge
1—15 ton General Electric HM-8-40 Locomotive
2—10 ton General Electric HM-8-28 Locomotives
1—300 KW General Electric 1200 RPM, Fully automatic M. G. Set.
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**CONVEYORS — GOODMAN G12½, SHAKER 250 VOLT DC**
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**MINING MACHINES — AC AND DC**
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8—112 G. 3 Goodman Standards 220 Volts A.C.
4—50 H.P. Goodman Universals 220 Volts A.C.
2—Goodman Track Cutting Machines 42" Gauge A.C. 220 Volts
1—Goodman Loading Machine 42" Gauge Type 360D A.C. 220 Volts.
3—35 B.B. Jeffries and 2—36 B Jeffrey 250 Volts D. C.
2—7B Sullivan Machines 250 Volts D.C.
4—512 E. L. 3 Cutting Machines A.C. 220 Volts.
50—H.P. 7½ ft. Cutter Bar on Joy Cat Trucks T-1
10—Joy Shuttle Cars with Batteries and Reel Type also.
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4—13 Ton G.E. Locomotive 42" Track Gauge.

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1—200 KW Ridgeway MG set, 2300 V. A.C., 250-275 V. D.C., 1200 RPM, complete with switchboard.

1—200 KW, 2300 volt AC, 250/275 volt DC, 900 RPM complete with switchboard.

2—150 KW G. E. MG sets, 2300 V. A.C., 250-275 V. D.C., 1200 RPM, with automatic circuit breaker.

1—90 KW G. E. MG set, 2300 V. A.C., 250 V. D.C., 1200 RPM, complete with switchboard.

1—75 KW Westinghouse MG set, 250 V. D.C., 220 V. A.C., complete with switchboard.

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7—512 EJH Goodman DC shortwall mining machines, complete with bug dusters, hydraulic control, 8½' cutter bars, cables, and Joy T1 cat trucks. Serial numbers: 8909, 8910, 8911, 8864, 8865, 8935, 934; (like new).

2—512-DG3A Goodman shortwall mining machines, AC, 8½' cutter bars complete with cable. With Joy T1-4G cat trucks.

2—512-EL3 Goodman shortwall mining machines, AC, 7' cutter bars, complete with Joy T1-4G cat trucks and cables.

3—Sullivan CLE5 longwall mining machines, 3/60/220 volts, with 4½' cutter bars.

2—12AA Goodman AC, 50 HP, standard shortwall mining machines. (With or without trucks).

4—Jeffrey 29U, 250 Volts, DC, 48" gauge cutting machines, 9' cutter bars.

## CRUSHERS

1—36 x 36 Jeffrey single roll crusher.

1—24 x 48 McNally Pittsburgh double roll crusher.

1—30 x 36 United Iron Works single roll crusher.

1—24 x 24 Hercules single roll crusher.

1—24 x 24 Webster single roll crusher.

1—24 x 24 Stephens Adamson single roll crusher.

1—12 x 16 Eagle Iron Works double roll chipper, complete with hopper and 7½ HP AC motor, (Mounted on one base. Like new).

1—48" McNally Pittsburgh Vertical Pisk Breaker.

2—American Pulveriser Company Ring Roll crushers.

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Several thousand feet of #6, 3/C, 5,000 volts lead covered armored cable.

Several thousand feet of 6/0, figure 8, trolley wire in long lengths.

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| | Make | Type | Gauge |
|---|---|---|---|
| 1—20 | ton Goodman | 36-AO4T | 42" |
| 1—15 | ton Jeffrey | MH110 | 42" |
| 1—10 | ton Jeffrey | MH110 | 42" |
| 3— 8 | ton Goodman | 32AO4T | 36" |
| 1— 8 | ton Goodman | 32AO4T | 42" |
| 1— 8 | ton Westinghouse | 4-2-35-C-437 | 36" |
| 4— 6 | ton G.E. | HM 821A | 42" |
| 1— 6 | ton G.E. | HM 763B | 42" |
| 1— 6 | ton Jeffrey | MH 64 | 42" |
| 1— 4 | ton Goodman | 42-I-4-T | 36" |

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19—15 ton Sanford Day Automatic drop bottom cars with multiple latch arch bar truck, 4 wheels under each end, 18" wheels, 36" gauge, Sanford Day roller bearing trucks. Overall dimensions: Overall length over bumpers 25'3"; Overall length inside 20'11½"; Overall width 6'10⅝"; Overall height 6'6". Size of door: Width 2'0". Length both doors 11'9½".

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Several hundred tons of rails, 56# and up, suitable for roof bars, random lengths from 8½' and up.

We carry splices, angle bars, track bolts, and track spikes in stock.

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1—Stephens Adamson two deck vibrator, size 4' x 10'.

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4—8BU DC Joy Loaders.

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We also carry a complete line of conveyors of all sizes, together with fans, feeders, hoists, electric motors both AC and DC, speed reducers, transformers, etc.
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200 Tons Trolley and Copper Feeder Cable.
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2—Joy T-1 Caterpillar Trucks.
2—Joy Belt Feeders.
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2—Brown Fayro Car Spotting Hoists, 250 V
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Link Belt Rotary Dump, power driven.
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2—Jeffrey 61WH, 15" Chain Conveyors.
2—Jeffrey 61HG Face Conveyors.
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2—Jeffrey 4 Ton Locomotives with Motor Driven Reels.
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New all-steel Armco Bldg. 60' x 120'.
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3—52 HP Vulcan 24½ Hoists with motors and controls
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140—90CFT ACF Mine Cars with Timken Bearings, 36 & 42" gauge. Good condition, Bargain
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6 Ton Westgh. 250 v. 36" Ga. 904
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4—5 Ton Goodman 30B 250 v. 42/44"
35 B Jeff. 250 v. Permissible
12 G3 Goodman Shortwall 220/3/60
35 BB Jeff. A.C. permissible

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| HP | MAKE | SPEED | TYPE | WDG. |
|---|---|---|---|---|
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| 300 | G.E. | 450 | IM | S.R. |
| 150 | G.E. | 880 | ATI | Syn. |
| 2—100 | G.E. | 450 | IM | S.R. |
| 100 | West. | 900 | | Syn. |
| 100 | West. | 1200 | CS | S.C. |
| 75 | West. | 900 | CS | S.C. |
| 50 | G.E. | 1750 | KT | S.C. |
| 50 | Al.Ch. | 1200 | AR | S.C. |
| 50 | G.E. | 900 | KT | S.C. |
| 40 | G.E. | 900 | MT | S.R. |
| 30 | G.E. | 900 | KT | S.C. |
| 30 | G.E. | 1200 | KT | S.C. |
| 20 | West. | 1200 | CS | S.C. |

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10 ton, 907C West., 36" Gauge.
8 ton, HM807, GE, 48" Gauge.
8 ton, HM818, GE, 36" Gauge.
8 ton, HM819, GE, 44" Gauge.
6 ton, HM703, GE, 36" Gauge.
5 ton, 944-B6, West., 36" Gauge. 125 Volts.
Armatures, 250 Volts
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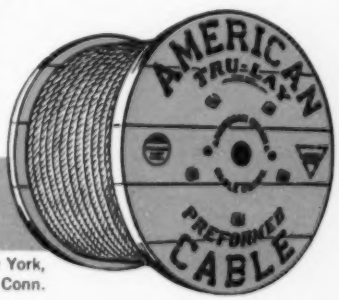


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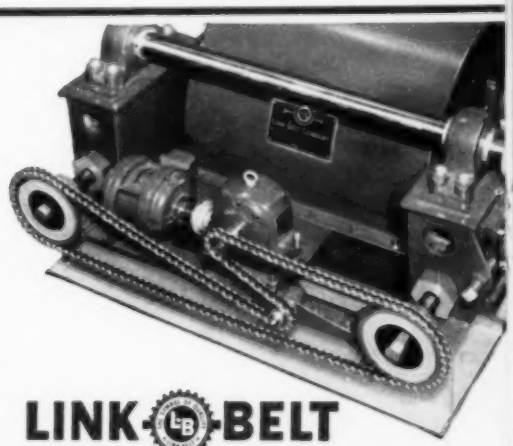

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